An Exploration of the Influence of Groups, Normative Scripts, and Status on the Levels of Group-based Reciprocation as well as the Evolution of Group-based Reciprocation in the Minimal Group Situation: Evidence from the Virtual Interaction Application Platform (VIAPPL)

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Declaration

"Unless specifically indicated to the contrary, this thesis is the product of my own original work"

Signed……

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Abstract

Background: Most reciprocation and outcome interdependence research has investigated how features of the situational context – including intergroup dynamics, normative scripts, inequality, and patterns of outcome dependence – affect the levels or frequency of reciprocation. Very little research has studied how the interactional behaviours of individuals can influence reciprocation over time. The present research aims to study intergroup reciprocation in interactive contexts where resource allocation elicits responses from a social network.

Methods: Interactional data were collected in the lab using the Virtual Interaction Application Platform (VIAPPL) platform which provides a virtual environment in which participants exchanged tokens over a series of rounds, under varied experimental conditions, such as Group Context where individuals either played in distinguished group or undistinguished; Status where individuals played as either unequal or equal groups; and Norm conditions (no norm, fairness, & competition). Analysis was done to assess the dependences in the data over rounds, and to investigate the predictors of reciprocation and the conjunction of conditions that promote reciprocation.

Results: The results showed that, when individuals were in clearly distinguished groups, they reciprocated more to the ingroup than to the outgroup. This was also true when Status and Norm Conditions were accounted for. It was however noted that the Norm Condition of fairness moderates ingroup reciprocation somewhat while the norm of competition heightened it even further. Ingroup reciprocation strengthened over time. Status did not influence reciprocation.

Conclusions: This study offers support for Yamagishi, Jin, and Kiyonari's (1999) theory of Bounded Generalized Reciprocity. It also adds to the literature by illustrating how group-based reciprocation bias can evolve over time in a generalized context as well as how the norm of fairness can moderate ingroup ingroup reciprocation bias. Reciprocation evolved – with ingroup reciprocation becoming stronger - over time in the group context only, this suggests that there are special properties in this context that may not be present in other contexts.

Keywords: Reciprocation; Group-based Reciprocation; Interdependence; Generalized Exchange Context; Minimal Group Paradigm

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Chapter 1 Introduction

Reciprocation, the act of repaying those who have shown you favour or disfavour in kind, is apparent in everyday life. We often feel obligated to reciprocate actions towards them. For instance, when we receive gifts (for birthdays, weddings, anniversaries etc.), we feel obligated to return this favour. This sort of behaviour has also been observed in other animals including birds. Research has shown that birds, such as Black-winged Blackbirds, often protect each other's nests. These birds often protect the nests of those birds that have protected their nest and do not protect the nest of those who have not helped them (Olendorf, Getty, Scribner, 2004).

Background

Much of the early work regarding reciprocation postulated that individuals will help all those who have helped them and will not hurt all those who have helped them, either for utilitarian purposes (Malinowski, 1932) or for moral reasons (Gouldner, 1960). Therefore, individuals who give will be reciprocated to in all contexts including group contexts, contexts of inequality, and varying norms.

The work of Thibaut and Kelley (1959) served to problematize this understanding of reciprocation. They argued that when group dynamics are introduced, the interdependencies that develop between ingroup members are likely to influence reciprocation.

Tajfel, Billig, Bundy, and Flament's (1971) minimal group experiments showed that individuals will act differently towards ingroup members, favouring them. While they raised the idea of social identity as an explanation, Yamagishi, Jin, and Kiyonari (1999) argued that bounded generalized reciprocity explained these results. Social Identity Theory (SIT) postulates that individuals will favour ingroup members in order to improve the relative standing of the ingroup. This in turn improves the individuals own social identity (Turner &

Tajfel, 1986). Bounded generalized reciprocity postulates that individuals are adapted to cooperate with other individuals, particularly ingroup members, in order to maintain a good reputation so as not to be excluded from social exchange (Yamagishi & Kiyonati, 2000).

Beyond intergroup dynamics, researchers have also shown that normative scripts and status influences the ways in which individuals distribute resources in the minimal group situation. Hertel and Kerr (2000) showed that individuals can be primed to promote equality rather than compete (Tajfel et al., 1971) with the outgroup. Rubin, Badea, Jetten (2014) showed that individuals of low status groups show compensatory ingroup favouritism or competitive in group favouritism deal with their low status. There is limited research regarding how these aspects influence levels of reciprocation.

Aims and Rationale

Much of the research regarding outcome interdependence and reciprocation has employed conventional methods of game theory (Balliet, Wu, & De Dreu, 2014).These methods are weak in that they are unrealistic and rigid. They are often dyadic in nature; this means that a generalized exchange context cannot be observed. A generalized exchange context refers to a context whereby a group of individuals are engaged in indirect exchange whereby cooperation is not necessarily reciprocated by the recipient of the cooperation, but may be reciprocated by other individuals (Yamagishi & Kiyonari, 2000). A generalized exchange context is important when assessing interdependencies amongst several individuals. The evolution of reciprocation is also difficult to assess with these dyadic methods do not allow for the sequential interaction of many individuals.

The present study employed the Virtual Interaction Application (VIAPPL) to study reciprocation and its evolution in the minimal group situation. This software offers a more dynamic and realistic approach to studying reciprocation.

The present study aimed to assess how intergroup dynamics, normative scripts, as well as status influence the levels of intergroup reciprocation in the minimal group situation. This study also further aimed to assess how reciprocation evolves in a generalized exchange context.

Study Objectives

Previous research using traditional game theory has shown how group dynamics can influence reciprocation (Rabbie et al., 1989; Yamagishi et al., 1999) have shown that group dynamics can influence reciprocation, limited research has studied the influence of normative scripts and status on reciprocation. The study of reciprocation and its evolution has been limited by the methodologies used which do not allow for a truly generalized exchange. With the use of more complex methods, this study has the following objectives:

1. To assess how group contexts influence the levels of ingroup and outgroup reciprocation, i.e. group-based reciprocation. This refers to reciprocation occurring between groups rather than between individuals.
2. To assess how the priming of normative scripts (fairness and competition) influences the levels of ingroup and outgroup reciprocation.
3. To assess how intergroup inequality influences the levels of reciprocation.
4. To assess how the levels of reciprocation evolve over time
5. To assess the interactional consequences of the above factors (group contexts, normative scripts, status) on the levels of reciprocation.
6. To contribute to social psychological investigation a novel method (VIAPPL), that addresses some of the limitations of studying interactional dynamics in experiments.

Research Questions

The objectives of this study are to assess how the levels of group-based reciprocation are influenced by group contexts, normative scripts, and status. In line with this, the research questions of this study are:

1. How do group dynamics influence the levels of ingroup and outgroup reciprocation?
2. How does the priming of normative scripts (fairness and competition) influence the levels of ingroup and outgroup reciprocation?
3. How does intergroup inequality influence the levels of intergroup reciprocation?
4. How do the levels of intergroup reciprocation evolve over time
5. How do the interactional consequences of the above factors (group contexts, normative scripts, status) influence the levels of intergroup reciprocation?

Definition of Terms

Generalized Exchange Context: This study argues that the previous studies on outcome interdependence and reciprocation are limited because they do not provide a generalized exchange context. A generalized exchange context refers a "…type of social exchange system in which the rewards that an individual receives from others do not depend on the resources provided by that individual" (Cheshire, 2016, p. 1). The resources that an individual receives are related to how an individual has treated other individuals and not necessarily how they have treated the allocating individual. The resource allocation is also related to how the allocator has been treated by other individuals. Traditional methods do not allow for a generalized exchange since interactions in these games largely occur in dyads.

Outcome Dependence/Interdependence: This refers to a situation where the outcomes of individuals who are interacting are intertwined (Yamgishi & Kiyonari, 2000). In this instance, the rewards that an individual receives are determined by other individuals and the individual determines the rewards that other individuals receive. This study argues that the outcome interdependence that develops when individuals interact in a generalized exchange context can influence reciprocation.

The Minimal Group Paradigm: This is an approach for studying the minimal conditions required for discrimination to occur between groups (Tajfel et al., 1971). This study employs this paradigm in line with previous studies on outcome interdependence and reciprocation in order to partial out the influence of other factors on reciprocation, such as race and gender.

Reciprocation/Reciprocity: Reciprocation refers to the act of responding to an action by making a corresponding act. This study is particularly focused on intergroup reciprocation. This study argues that the context of an interaction will influence the levels of ingroup and outgroup reciprocation.

Intergroup Reciprocation/Group-based Reciprocation: This refers to reciprocation occurring between groups**.** This is in contrast to interindividual reciprocation which refers to reciprocation assessed at the levels of individuals. This study assessed how the levels of

intergroup reciprocation are influenced by group contexts, normative scripts, and status. If an individual gives to an ingroup member in round n, what is the likelihood that this individual will receive from the ingroup in round n + 1?

Delimitation and Scope of Study

This study is particularly focused on the levels of intergroup reciprocation and how they are influenced by different contexts (group context, norms, and status) as well as how they evolve over time. This study does not assess inter-individual reciprocation or other important aspects in the process of reciprocation, such as reputation and the consequences of non-reciprocation.

Overview of Dissertation

Chapter one offers a brief introduction to the study as well as the objectives and scope of the study. Chapter two provides a substantial argument for the need of this study. It discusses the early conceptualization of reciprocation and serves to problematize it as well as the methods used to study reciprocation. This section also discusses research on normative scripts and status and how these factors may influence reciprocation. Chapter three discusses the methodology employed in this study with particular reference to the research design, sampling, the reliability, the validity, ethical considerations, data collection, and the data analysis techniques employed in this study. Chapter four presents the results of the study. Chapter five discusses the results of the study in relation to the literature presented in chapter two. Chapter six summarizes the findings of the study and discusses their implications as well as their limitations.

Chapter 2 Review of Literature

Trivers (1971) argued that social life contains numerous opportunities for self-interested individuals to cheat or to fail to reciprocate. Even in modern human societies, where infrastructures facilitate exchange between groups and individuals, the incentive to cheat in cooperative situations is "…probably the rule rather than the exception" (Fehr, Fischbacher, & Gächter, 2002, p. 1). There is thus a widespread belief that people will act selfishly in contexts of social and economic exchange, especially in the absence of overt regulation and surveillance.

Despite this, many authors have argued that reciprocation is a common occurrence and a fundamental characteristic of human interaction. Becker (1956) viewed reciprocity as being so fundamental to human interaction that he referred to humans as *Homo Reciprocuses.* Hobhouse (as cited in Gouldner, 1960) asserted that reciprocity is the imperative attitude of society as well as the fundamental characteristic through which social stability is achieved. Thurnwald (1932) also advocated that reciprocity is pivotal to the functioning of societies. He saw reciprocity as an imperative that permeates every aspect life and as forming the foundation upon which all social and ethical life is founded. Simmel (as cited in Gouldner, 1960) goes as far as to state that society as we know it could not exist without the give and take (reciprocity) evident in everyday life.

This review of the literature will discuss some of the early conceptualizations of reciprocation, which argued that reciprocation is likely to occur in all situations either for utilitarian (Malinowski, 1960) or moral reasons (Gouldner, 1960).This conceptualization of reciprocation will then be problematized referring to literature that suggests that group dynamics (Thibaut & Kelley, 1959; Yamagishi & Kiyonari, 2000), norms (Pettigrew, 1958;

Gerard & Hoyt 1974; Hertel & Kerr, 2000), and intergroup status (Tajfel & Turner, 1985; Fehr & Schmidt, 1999; Rubin, Badea, & Jetten, 2014) can influence the way in which group-based reciprocation manifests itself. All of this will be done in the context of the work of Tajfel, Billing, Bundy, and Flament (1971), who in their minimal group studies, showed how the simple act of transforming a context (group context) can influence the distribution of resources. The workings of reputation in a generalized exchange context, where a group of individuals are engaged in indirect exchange, and how this may affect reciprocation and its evolution will also be discussed. Additionally, the methods employed to study interdependence and reciprocation in the minimal group situation will be problematized and the Virtual Interaction Application Platform (VIAPPL) will be offered as an alternative method.

Principles of Reciprocity

Malinowski (1932) developed several principles of reciprocity grounded in his anthropological work in so-called "primitive societies". Malinowski (1932) asked why rules of interaction are followed when they are costly and tiresome? He disagreed with the claim that reciprocity arose simply due to the respect and reverence that "primitive people" had for traditional custom and authority. Instead, he viewed reciprocity as a more fundamental "social machinery" through which custom and authority are built. This cultural machinery operates through an evolving network of obligations that Malinowski argued would be evident in ritualistic deeds conducted by individuals and groups (e.g., paying a cow for impregnating a maiden in order to restore the lost pride of the maiden's family). In Malinowski's view, reciprocity refers to the intertwined status duties that individuals owe to one another. This is a situation whereby individuals partake in deeds that elevate the statuses of each other. He therefore views reciprocity as occurring within an established partnership and is related to fixed social ties. Malinowski further argued that reciprocity necessitates a mutual dependence of individuals, whereby there is a division of labour and individuals hold their end of bargain in order for the society to function. Based on this, Malinowski (1932) pointed out three assumptions under which individuals could be operating. These are that (a) in a prolonged interaction of individuals in the exchange of goods and services, the benefits accrued will balance out between the individuals; or (b)

when individuals do not reciprocate the positive actions of others towards them, they will experience negative consequences from other individuals; or (c) there is an expectation that those that they help will help them in the future.

As Gouldner (1960) points out, Malinowski (1932) sees reciprocity as occurring as a result of its utilitarian value as well as the understanding of the consequences of non-reciprocation imposed by other individuals. Individuals reciprocate because they believe that they will accrue additional benefits from doing so as well as because of the fear of being ostracized by other individuals if they do not reciprocate. Gouldner (1960) agrees with these arguments, he however adds a third component that he believes explains reciprocity. In line with this, Gouldner (1960) argued that individuals may reciprocate, not only because of its utilitarian value or the fear of punishment, but they may also do so because of a shared moral norm. He further argues that there is a moral imperative for individuals to assist those who have assisted them and states that, "…beyond reciprocity as a pattern of exchange and beyond folk beliefs about reciprocity as a fact of life, there is another element: a generalized moral norm of reciprocity which defines certain actions and obligations as repayments for benefits received" (p. 170). As a result of this, Gouldner (1960) developed an argument of a norm of reciprocity.

The Norm of Reciprocity

Gouldner (1960) argues against cultural relativism and posits that the norm of reciprocity is universal, adding that the process of being grateful for or reciprocating a given benefit is everywhere and in most cases, a duty. He suggests that even though reciprocity may be a fact, the actual articulation of reciprocity may differ with time and place. Regardless, Gouldner (1960) argues that there are two universal and intertwined minimal demands that the norm of reciprocity makes on individuals. These are that individuals must assist those who have assisted them and that individuals must not harm those who have assisted them. Broadly speaking, the norm of reciprocity can be seen as a feature of all value systems and moral codes. Though reciprocity may be universal, Gouldner (1960) asserts that the application of reciprocity may differ according to the amount of benefits accrued. Gouldner (1960) argues that the value given to a benefit is based on various factors including the recipient's need when they received the benefit, the resources of the individuals who gave the benefit, and the reasons that are assumed for an individual's giving.

Gouldner (1960) further argues that the norm of reciprocity is a substantive and distinct instrument that is crucial in maintaining stability in social systems. Why would the principles of reciprocity be insufficient in maintaining stability in social systems and Gouldner's norm of reciprocity be necessary? Gouldner (1960) argued that a moral norm of reciprocity that goes beyond the utilitarian explanation of reciprocity proposed by Malinowski (1932) is necessary for maintaining social stability through reciprocity due to the, "…disruptive potentialities of power differences" (p. 174). He states that due to power differences amongst individuals inherent in society, powerful individuals might attempt to gain benefits without reciprocating them. This circumstance is ripe for the crumbling of reciprocity and the social systems it maintains. The norm of reciprocity, however, stimulates the need to repay benefits that have been incurred from other individuals even in a situation where the power dynamics at play could lead to the exploitation of certain individuals. The norm therefore, as Gouldner (1960, p. 174) attests, "…safeguards powerful people against the temptations of their own status; it motivates and regulates reciprocity as an exchange pattern, serving to inhibit the emergence of exploitative relations which would undermine the social system and the very power arrangements which had made exploitation possible".

Gouldner (1960) posits that it is not only through the repayment of obligations that social systems are maintained. This is apparent when we consider the fact that reciprocation may occur over an extended period of time. That obligations that have been incurred are not usually repaid immediately but are repaid after a period of time. The main reason why obligations that are to still be repaid maintain social systems, Gouldner (1960) argues, is because it is injudicious for those who are owed obligations to sever ties with those individuals who owe them obligations. This is because this exponentially decreases the chances of them getting repaid. It is also inadvisable for those who owe obligations to sever ties with those they owe because they will not be able to incur more favours without having repaid their debt or showing that they have no intentions of repaying the debts they owe by severing ties with their debtors. Added to this, under the norm of reciprocity, it is morally indecent to sever relations or initiate conflicts against people to whom an individual owes obligations. Another way in which reciprocity maintains social systems is related to the fact that a rough equivalence of the obligations owed are repaid. Obligations owed are not repaid in exact amounts but in rough amounts where the amounts owed and the amounts

paid are roughly the same. Gouldner (1960, p. 175) points out that, this results in "…a certain amount of ambiguity as to whether indebtedness has been repaid and, over time, generates uncertainty about who is in whose debt". All this, however, is dependent on a mutual shared notion of the moral propriety of repayment, begotten by the norm of reciprocity.

Group Dynamics and Fate Control

The work of Thibaut and Kelley (1959) has pointed out that reciprocity may manifest itself differently in large groups due to the interdependence that may develop amongst group members. Thibaut and Kelley argued that there are different norms of reciprocity and interdependence that exist within groups that do not exist in a dyad of individuals who interact in larger society. While Malinowski (1932) and Gouldner (1960) hypothesized about the latter, Thibaut and Kelley (1959) discussed the former. These norms that exist within groups are present when: (1) there is a consensus amongst group members regarding actions that are deemed acceptable and unacceptable for group members, and (2) if social practices exist that ensure loyalty to what is required of group members.

As the discussion moves from norms in a dyad to norms in large groups, the functional contributions of norms become more pronounced in maintaining group cohesion (Thibaut & Kelley, 1959). As the size of the groups increases, it becomes more difficult and costly to attain consensus amongst members of a group. Therefore, as Thibaut and Kelley (1959, p. 239) pointed out, "…as groups become larger, it becomes increasingly important that regularized and dependable agreements supplant the informal process of attaining consensus *ad hoc* each time a new issue arises". Additionally, as the number of people in a group increases, the interferences in response sets are also likely to increase. This may result in higher costs and lower gains for group members. With an increase in group size, a division of labour between group members arises. This additionally makes controlling the behaviour of group members more difficult and complex (Thibaut & Kelley, 1959). The solution to this is the development of specialized and complex norms beneficial to members of the group and mechanisms to ensure that these norms are adhered to. These complexities that develop in the context of groups rather than dyads is a main reason why this study seeks to assess intergroup reciprocation in a generalized exchange contex rather than reciprocation in a dyad.

Thibaut and Kelley (1959) argued that, generally, group norms ensure that individuals act in ways in which they would not habitually act of their own accord. These are not then acts that an individual would perform because they are inherently valuable to them. But rather, ones that a group can only ensure by fate control over an individual (Thibaut & Kelley, 1959).

For instance, if a group is dependent on one of its members for the fulfilment of an activity (i.e. taking minutes at a meetings). This is not an activity that an individual would usually gain personal rewards from doing, but one from which the group derives rewards. If the group has fate control over the individual, (i.e. the other group members could deny the individual rewards or punish the individual) the group can ensure or make it more likely that an individual will take the minutes. Indeed, in Kelley and Thibaut's (1978) later work, regarding the interdependence of individuals, persons have multilateral fate control over each other, meaning that each subject can at least partially affect the outcomes of other subjects in the in a given situation regardless of the actions other individuals take. Kelley and Thibaut defined interdependence as, "the presence of fate control and/or behaviour control in each actor in a relationship" (as cited in Karp, Jin, Yamagishi, & Shinotsuka, 1993, p. 232). In this situation, members of the group are dependent on one another since they have fate control over one another in ways that non-members of the group do not have. Hence, the ways in which members of the group interact with non-members of the group may differ in some situations.

Thibaut and Kelley (1959) argued that, in order for fate control to be effective in a group, (1) the expected behaviour of each individual in the group as well as the consequences of differing must be understood by the group members, (2) there must be surveillance by group members to ensure that other group members play their part, and (3) there must be ways of rewarding individuals for good behaviour and punishing them for indiscretions towards the group.

Much of the early conceptualizations of reciprocity, including Brazelton, Koslowski, and Main (1974); Patterson (1970); Goranson and Berkowitz (1966); and Altman (1973), have revolved around Malinowski's (1932) and Gouldner's (1960) argument about reciprocity as a universal concept that manifests itself in the same way in all contexts. That in all contexts, if an individual gives to another, the other individual will give back to the individual. Either

solely for utilitarian purposes, as Malinowski (1932); Goranson and Berkowitz (1966); and Goranson (1964) argue, or as a moral obligation, as Gouldner (1960) and Berndt (1977) argue. Although Gouldner (1960) concedes that the level of reciprocation may vary according to various factors; including the need of the receiver when they were given a benefit or the amount of resources the giver has at the time of giving, the point nevertheless still stands that if one receives, one will give. In contrast to this understanding of reciprocity as a universal phenomenon that manifests itself in the same way in all contexts; the work of Thibaut and Kelley (Thibaut & Kelley, 1959 as well as Kelley, Thibaut, Radloff, & Mundy, 1962) have served to problematize this understanding. Thibaut and Kelley (1959) pointed out, as discussed above, the ways in which interdependence amongst group members in group contexts can influence individuals. Evidence of the ways in which intragroup interdependence can influence the distribution of resources can be found in the work of Tajfel, Billing, Bundy, and Flament (1971) as well as in the criticisms of their explanations of the results (Rabbie, Schot, & Visser, 1989; Yamagish & Kiyonari, 2000).

The Minimal Group Paradigm

The minimal group paradigm was utilized by Tajfel et al. (1971) in order to circumvent the influence of factors that are not of interest to an experimenter. Tajfel et al. (1971) wanted to study whether just the separation of individuals into different groups without the influence of other factors, such as social history, can influence the giving patterns of individuals. In Tajfel's et al. (1971) minimal group paradigm, the only difference between the groups was the fact that they believed they were grouped by a trivial category. Tajfel et al. (1971) used the individuals' preference either for Klee or Kandinsky paintings. The aim of this paradigm was to prove that social categorization was sufficient to cause intergroup discrimination and ingroup favouritism. Diehl (1990) posits that the following conditions must be met in the minimal group paradigm. Firstly, the individuals should have no face-to-face interaction, either between ingroup or outgroup members. Secondly, absolute anonymity of group membership must be maintained at all times. Third, there should be no instrumental or rational link between the criteria for intergroup context and the nature of ingroup and outgroup responses requested from the subjects. Fourth, individuals should not accrue any direct benefits from the decisions they make in the minimal group (though this

was challenged and changed by later researchers i.e. Yamagishi et al. (1999) and Rabbie, Schot, and Visser (1989) as will be discussed later.

In Tajfel's et al. (1971) experiments, participants were asked to assign rewards or penalties to other participants, either those from the ingroup or the outgroup. The outcomes of the experiment revealed that the way in which resources were allocated by the participants of all the groups resulted in ingroup favouritism and outgroup discrimination. A second experiment confirmed the results. Added to this, the second experiment also showed that participants not only favoured their own group, they often did this in a way that maximized the relative difference in resources between the groups and not necessarily in a way that maximized the actual resources of their group (Tajfel, as cited in Diehl, 1990).

Tajfel et al. (1971, p. 176) summarized their finding as follows:

"In conclusion, the crucial results of the study can be simply restated as follows: in a situation in which the Ss' own interests were not involved in their decisions, in which alternative strategies were available that would maximize the total benefits to a group of boys who knew each other well, they acted in a way determined by an ad hoc intergroup context. We interpreted these results in terms of the functioning of a 'generic' social norm which was perceived by the Ss as relevant to the solution of a problem of social conduct with which they were confronted. There is ample evidence in the data that this was a deliberate strategy which applied even when Ss' group getting more than the outgroup directly conflicted with simple 'material' gain for the ingroup".

The results of the above experiment illustrated that the simple act of introducing group dynamics can change the ways in which individuals interact, as Thibaut and Kelly (1959) suggested. Though Tajfel's understanding of the results did not include intragroup interdependence but rather focused on social identity and norms. In later works, Tajfel (1972), elaborated on the reasons why he and his colleagues found the above results. He argued that individuals' intergroup discrimination was an attempt to achieve a positive social identity for their ingroup. This concept was developed further in later works, including Tajfel (1974) and Turner (1975), and culminated in the formation of the Social Identity Theory (SIT) (Tajfel & Turner, 1985).

Social Identity Theory (SIT)

The SIT account of the results of the first minimal group experiment supposes that the ingroup bias that occurred was not only a cognitive process in which the participants tried to make sense of their environment, it was also a way of, "…defining one's place in society"

Reciprocation

(Diehl, 1990, p. 269). Tajfel and Turner (1985) argued that social groups define a person's social identity and that this encourages individuals to compare the ingroup with the outgroup. In this instance, social identity refers to those facets of a person's identity that he/she obtains from his/her membership to a group. By comparing the ingroup and the outgroup, individuals come to the conclusion that the ingroup is either equal to, of a higher status, or of a lower status than the outgroup. Tajfel and Turner (1985) argued that this conclusion contributes to an individual's self-esteem. Therefore, if the ingroup is of a higher status than the outgroup, ingroup members have higher self-esteem. Based on this, Tajfel and Turner (1985) proposed three principles. Firstly, persons endeavour to realize and sustain a positive social identity. Second, a significant portion of social identity is grounded on positive appraisals of the ingroup against the outgroup. Third, if the appraisal of the ingroup puts it in a negative light, persons will either move to a more positively valued group or take actions that improve the value of their own group. This can be done either through individual mobility, where an individual moves to a group of a higher status or social creativity, where individuals redefine assessment criteria so they are in their favour.

Besides intergroup context, Tajfel and Turner (1985) point out three other factors that are needed for intergroup differentiation. Firstly, members of groups need to have internalized their group membership as a part their self-concept. Secondly, an individual must have dynamics on which to evaluate groups. Thirdly, the outgroup must be a relevant comparison group, meaning that they must have comparison dimension compatible with the ingroup as well as be proximal to the ingroup. According to this viewpoint, minimal groups, "…are highly comparable groups which share a consensually valued comparison dimension (distribution of rewards). Because there is no possibility of individual mobility or social creativity for members of minimal groups, they are restricted to social competition in achieving intergroup differentiation" (Diehl, 1990, p. 270). The objective of this social competition is establishing a positive social identity so as to augment an individual's self-esteem. In the minimal group context therefore, a positive social identity can only be achieved by allocating resources that leads to intergroup discrimination (Tajfel & Turner, 1985).

It should thus be expected from SIT that intergroup discrimination in the minimal group experiments should result in a rise in an individual's self-esteem (Diehl, 1990). Indeed,

Oakes and Turner (1980) as well as Lemyre and Smith (1985) found that individuals who had discriminated in the minimal group paradigm had a higher self-esteem than individuals who did not discriminate.

SIT does not in and of itself explain how intergroup dynamics can change the way in which reciprocation manifests itself. This has come from the research and arguments that have spawned as criticisms of the SIT explanation of the results of the minimal group experiment conducted by Tajfel et al. (1971). The criticisms that are particularly relevant with regards to the way in which intergroup dynamics fundamentally reshape the way in which reciprocation manifests itself are those that argue that in the minimal group experiment, group context is confounded with outcome dependence (Rabbie, Schot, & Visser, 1989; Gaertner & Insko, 2001; Yamagishi, Jin, & Kiyonari, 1999; and Yamagishi & Kiyonari, 2000). Individuals allocate resources to those individuals who will be able to reciprocate the gesture.

Mutual Interdependence and Intergroup Dynamics

Karp et al. (1993) argued that the ingroup bias evident in Tajfel's et al. (1971) minimal group paradigm is an important finding for theories of intergroup relations. However, as stated earlier, Tajfel's interpretation of the findings was contentious. Yamagishi and Kiyonari (2000, p. 117) point out that, in Tajfel's et al. (1971) minimal group experiment, there is "…a residue of interdependence existing in the form of mutual or multilateral fate control". This observation is grounded on the recognition that the minimal group situation is not as minimal as was first thought. The minimal group situation was thought to be void of an interdependence of the participants' interests. The reality, according to Yamagishi and Kiyonari (2000), was that one's actions affected other participants' actions and that the actions of other participants indirectly affect one's interests. This is what Thibaut and Kelley (as cited in Yamagishi & Kiyonari, 2000) referred to as mutual behaviour control. Thibaut and Kelley (1959) pointed out that interdependence amongst ingroup members can arise if there is a mutual fate control amongst ingroup members. This was assumed not to be the case in the minimal group situation. However, the payments that participants received in Tajfel's minimal group experiments were actually reliant on the actions of other participants. In arguing that the way in which participants in minimal group experiment apportion rewards amongst ingroup and outgroup members had no utilitarian consequence

to the allocator, Tajfel et al. (1971) missed the fact that the rewards that an the allocator gets are also determined by the would be recipients. As Yamagishi and Kiyonari (2000, p. 117) point out, “they allocate money and, at the same time, others allocate money to them”. The outcomes of participants are therefore dependent on other participants.

Interdependence of individuals was first posited as the cause for ingroup bias in the minimal group paradigm by Rabbie et al. (1989). They argued that, as a result of the interdependent nature of reward allocation, individuals could expect more favours from their fellow group members by giving them favours. Specifically, they posit that individuals in the minimal group situation favour members of their own group assuming that the ingroup members will reciprocate the favour. Hence, even though individuals in Tajfel’s et al. (1971) minimal group paradigm are not able to directly allocate resources to themselves, they can do so indirectly, on their rational supposition that other ingroup members will reciprocate their favour. By being more generous to the ingroup as opposed to the outgroup, they would boost their chances of maximizing their own outcomes. Thus, Rabbie et al. (1989) argue that there is a rational connection between economic self-interests and the tactic of ingroup favouritism in the minimal group paradigm.

Rabbie et al. (1989) hypothesized that the higher the supposed interdependence of outcomes on the ingroup, the higher the ingroup favouritism that will be witnessed. Likewise, the higher the alleged outcome interdependence on the outgroup, the greater the amount of outgroup favouritism that will occur. In their experiment assessing this hypothesis they utilised the minimal group design with a few adjustments. One of these was an experiment condition in which individuals made allocations to both ingroup and outgroup members, and their own outcomes were dependent upon both groups. In a second condition, individuals made allocations to both groups but only relied on the ingroup for their own rewards. In a third condition, individuals only relied on the outgroup for their own rewards. When individuals’ outcomes were reliant on the ingroup, ingroup favouritism was highest, and when outcomes were dependant on the outgroup only, outgroup favouritism resulted.

The expectations of participants the minimal group situation has also been investigated. Yamagishi et al. (1999) demonstrated that ingroup favouritism was higher amongst individuals who expected more favours from ingroup members. This demonstrates that

individuals do not unreservedly favour ingroup members just because they are ingroup members, as SIT suggests. Rather, individuals are more favourable to ingroup members only in situations where they anticipate that ingroup members will treat them favourably in return. As Thibaut and Kelley (1959) argued, individuals are likely to favour ingroup members when there is mutual fate control amongst the ingroup members, i.e. interdependence. These later findings in the minimal group situation have shown that ingroup favouritism is not as a result of identity strengthening as Yamagishi and Kiyonari (2000, p. 118) point out, "…if that were the case, participants should have treated ingroup members favourably even when they did not expect similar favourable treatment from them". Researchers such as Yamagishi et al. (1999) and Rabbie et al. (1989) have argued that it is rather reciprocation at work, where individuals favour those who they expect to favour them.

Within the argument that reciprocation is at play within the minimal group situation, there are differing perspectives on how it is at play. Reciprocation is either argued to be unbounded (Rabbie et al., 1989) or bounded (Yamagishi et al., 1999). Unbounded reciprocity represents the earliest conceptualization of reciprocity within the minimal group situation. The argument for unbounded reciprocity, proposed by Rabbie et al. (1989), posits that individuals will cooperate with an individual that can reciprocate their kindness regardless of group affiliation. This was evidenced in their work discussed above.

Yamagishi et al. (1999) on the other hand, illustrated that when individuals are equally dependant on ingroup and outgroup members, they are likely to favour the ingroup. This led Yamagishi et al. (1999) to argue that reciprocity is bounded, meaning that individuals favour those who favour them or those they expect to favour them, but that individuals prefer to reciprocate within the ingroup. This realization led Yamagishi et al. (1999) to develop the theory of Bounded Generalized Reciprocity (BGR).

BGR is based on an evolutionary perspective on social cooperation, proposed by Axelrod & Hamilton; Bowles and Gintis; Darwin; Henrich and Henrich; Trivers; Wilson (as cited in Balliet, Wu, and Dreu, 2014). BGR argues that groups played a fundamental role in the reproduction and survival of individuals. Additionally, BGR argues that groups offer individuals a vessel for a generalized exchange network. Meaning that groups contain a system of indirect reciprocity in which people act in ways that sustain a positive reputation.

Reciprocation

This is because individuals are more likely to cooperate with other individuals who have a reputation of cooperating and are less likely to cooperate with individuals who have a reputation of not cooperating. Therefore, individuals need to sustain a reputation of a reliable co-operator with the ingroup so that they are not excluded from the generalized exchange network by other ingroup members. BGR states that individuals evolved,

"(a) to have depersonalized and generalized trust that other ingroup members will cooperate,

(b) to be motivated to establish and maintain a cooperative reputation among ingroup members, and

(c) to expect to receive benefits from other ingroup members, but not necessarily from the same ingroup members they cooperated with or helped" (Balliet, Wu, & Dreu, 2014, p. 1559).

Prompts of group membership are argued to strengthen trust, reputational concerns, and cooperation, even when there is no clear outgroup and when there is no possibility for direct reciprocity from an individual's present interaction partner. Therefore, BGR posits that as a result of generalized trust in ingroup members and wanting to construct a positive reputation within the ingroup, individuals cooperate with ingroup members more than with outgroup members and unclassified strangers (Mifune, Hashimoto, & Yamagishi, 2010; Yamagishi et al., 1999). Indeed, Stroebe, Lodewijkx, and Spears (2005); Gaertner and Insko (2000); and Yamagishi et al. (1999) found that individuals tend to favour ingroup members, particularly when there is a possibility that they could reciprocate.

Though both SIT and BGR argue that ingroup favouritism will occur, SIT posits that this will occur in order to sustain or formulate a positive social identity. BGR argues that ingroup favouritism occurs for utilitarian purposes and is conditional. Meaning that individuals who do not contribute to the generalized exchange of the ingroup are likely to be excluded from the generalized exchange. Individuals will also not favour ingroup members when there is no possibility of generalized exchange, for instance in Rabbie's et al. (1989) study where individuals' outcomes are solely reliant on the outgroup. BGR offers the best argument for the way in which reciprocity manifests itself fundamentally changes as a result of intergroup dynamics. Individuals favour ingroup members, therefore, reciprocation as a universal

phenomenon, as argued by Gouldner (1960) and Malinowski (1932), is limited. In intergroup dynamics, this attitude becomes nucleated within the group. One of the aims of this study is to ascertain how group dynamics influence the level of inter- and intragroup reciprocation.

Normative Scripts

An alternative explanation of the results of the original minimal group experiments was that the intergroup dynamics of the minimal group experiments induced a generic norm of cooperation among group members (Berkowitz 1994; Gerard and Hoyt 1974). Ground-breaking work by Pettigrew (1958) uncovered the importance of social norms in inducing prejudiced attitudes, casting doubt over earlier psychodynamic and individualistic accounts of intergroup discrimination. Building on this, Hertel and Kerr (2000) point out that Tajfel's (1970) original explanation of the minimal group experiments was that of a generic norm of cooperation. The argument of a generic norm of cooperation postulates that individuals may favour members of the ingroup merely due to the fact that it is a social norm, which refers to, "a social script prescribing favouritism or loyalty to one's group as an expected and socially approved behaviour" (Hertel & Kerr, 2000, p. 317). Hertel and Kerr (2000) argue that normative social scripts are learnt through social interactions in intergroup dynamics where group loyalty is compensated in numerous ways. This is particularly true in situations that are ambiguous, such as the minimal group situation, where there are limited contextual signals to aid people in decision making. In this instance, individuals may not necessarily base their decisions of self-interest, as Rabbie et al. (1989) and Yamagishi et al. (1999) suggest, but rather, may defer to normative scripts that have been rewarded in previous interactions, and may therefore reciprocate within their own group (Hertel & Kerr, 2000).

Added to its proposed explanation of ingroup favouritism in the minimal group situation, Hertel and Kerr (2000) argue that the normative scripts perspective could also identify circumstances under which individuals will not show ingroup favouritism or will show even greater ingroup favouritism. Loyalty to the ingroup is one of many potential normative scripts that could be triggered in the minimal group situation. The norm of equality could be triggered. As Messick and Schell (1992) point out, the norm of equality is highly socially acceptable in society and can therefore be stored in individuals' cognition and retrieved from memory in the same way that the ingroup loyalty script can. The type of normative

script that is retrieved depends on the context in which an interaction is occurring. It is argued that different cues have the ability to trigger (or prime) different normative scripts and therefore affect the levels of ingroup and outgroup favouritism in the minimal group situation (Hertel & Kerr, 2000).

Indeed, it is possible that the type of normative script primed through experimental procedures in the minimal group situation not only affects the resource allocation inclinations of individuals, it can also influence, "the subjective consequences of allocation behaviour" (Hertel & Kerr, p. 317). Here, the self-esteem increase seen after intergroup bias in Tajfel's et al. (1971) minimal group experiment is argued to occur as a result of the research procedures that prime ingroup loyalty. In these circumstances, individuals who show ingroup favouritism are doing what they feel they are expected to do, i.e. be loyal to the ingroup, and will therefore have an increase in self-esteem. This increase in self-esteem is not based on positive identification, as SIT suggests, bit is rather due the satisfaction that individuals feel as a result of doing what the norms of the situation expected them to do. This argument suggests that if another norm, the norm of equality for instance, is primed over the norm of group loyalty, individuals' actions will have a different impact on individuals' self-esteem. Indeed Vickers (as cited in Hertel & Kerr, 2000) found that when the norm of equality was primed in the minimal group situation, individuals were more likely to distribute resources equally. Those that did, showed an increase in self- esteem while those that still showed ingroup favouritism had a decrease in self-esteem. Hertel and Kerr (2000) found similar results, additionally illustrating that as the primed norm changed, so did individuals' perceptions of how other individuals expected them to act. Therefore, when the norm of group loyalty was primed, individuals felt that other individuals expected them to favour the ingroup whereas when the norm of equality was primed, individuals felt that other individuals expected them to distribute resources to relatively deprived individuals.

If it is to be taken that group context produces a norm of ingroup cooperation and Yamagishi et al. (1999) argues that in this context individuals, individuals reciprocate to ingroup members to maintain a good reputation amongst ingroup members. This study seeks to ascertain whether or not the level of ingroup and outgroup reciprocation change when norms are changed, this study will implement norms of competition and fairness.

Reciprocation

Relative Status

The relative status of individuals has also been posited to effect the distribution of resources in individual and group contexts where there is an interdependence of individuals. As stated earlier, SIT (Tajfel & Turner, 1986) posits that inequality between groups will enhance or maintain positive feelings about being a member of the high-status group. Alternatively, as a result of social comparison, members of the lower status group understand the comparative superiority of a higher status group; their relative standing is likely to negatively affect their social identity. In this instance, positive group distinctiveness may be achieved by means of direct competition with the higher status out-group. The low-status group as a whole may adopt a strategy in which they collectively mobilize to improve their status versus the high-status group. SIT posits that members of the high status group will in turn cooperate amongst each other in order to maintain their positive distinctiveness. More specifically, a low status group will mobilize to improve their status by maintaining resources within the group through ingroup favouritism particularly when status is illegitimate and unstable, such as in this study. Alternatively, in situations where status is seen as stable and legitimate, low-status groups show outgroup favouritism. Rubin and Hewstone (as cited in Rubin et al., 2014) theorize the outgroup favouritism of high status groups by low status groups as consensual discrimination as it indicates consensual views of intergroup status that are believed by individuals of both the high and low status groups. On the other hand, Jost, Banaji, and Nosek, (2004) argue that the outgroup favouritism shown by low status groups is a more active attempt to justify the intergroup status system.

Additionally, Fehr and Schmidt (1999) argue that individuals may be inequity averse and this may affect how they reciprocate. Fehr and Schmidt (1999) state that an individual is inequity averse when they are opposed to circumstances that are seen as inequitable. They further state that individuals use various criteria in real life circumstances to decide what is inequitable. In game theory, individuals will base this on the number tokens that individuals have since this is the most prominent resource. Loewenstein, Thompson, and Bazerman (1989) have also shown that individuals show a strong and vigorous aversion towards disadvantageous inequality when an individual's own resources are lower when compared to other individuals. Many individuals also have an aversion towards advantageous inequality; this however, is less robust than the aversion to disadvantageous inequality.

Reciprocation

Inequity aversion theory posits that ingroup members of the disadvantaged group will practice ingroup favouritism to ensure parity amongst the groups. Members of the high status group may also show outgroup favouritism in order to promote intergroup parity.

The research of Rubin, Badea, and Jetten (2014) has produced evidence supporting both perspectives, SIT and inequity aversion. Rubin et al. (2014) found that members of low status groups generally utilized two strategies to get over the inequity, compensatory ingroup favouritism and competitive ingroup favouritism. Rubin et al. (2014) thus argued that it is conceivable groups of lower status can employ ingroup favouritism in two different ways and for two different reasons. Ingroup favouritism was employed to compete with an outgroup of a higher status so as to achieve positive ingroup distinctiveness. Rubin et al. call this approach competitive ingroup favouritism. Ingroup favouritism was also employed to compensate the ingroup for its low status so as to realize intergroup fairness. They call this approach compensatory ingroup favouritism. Therefore, competitive favouritism raises a low status group to a level better than that of the outgroup, while compensatory ingroup favouritism raises a group of a low status to a level that is the same as the out-group. More recent evidence from a study employing similar methods to the present study (Durrheim et al., 2016) offered support for compensatory ingroup favouritism and found that in the context of illegitimate intergroup inequality, such as in this study, the low status group showed ingroup favouritism and that compensatory outgroup favouritism was seen from the high status group. Additionally, the study also found that ingroup favouritism from low status group and outgroup favouritism from high status group decreased as time progressed and the groups became more equal.

Yamagishi et al. (1999) as well as Hertal and Kerr (2000) have shown that a change of context can influence norms of cooperation, this study seeks to assess the norms of reciprocation that will develop in the context of illegitimate intergroup inequality. Will individuals reciprocate in ways that promote intergroup equality as previous studies suggest?

Reputational Concerns and the Evolution of Reciprocation

A main reason why this study believes that individuals will act according to the prevailing reciprocal norms and that individuals who do not act according to this expectation will be ostracized, that they will be altruistically punished, is that individuals have been shown in

various circumstances, particularly when they are being observed, to be motivated to develop *and maintain* a good reputation (See Brandt, Hauert, & Sigmund, 2003). The importance of reputation in the development of social networks was discussed earlier in relation to Yamagishi's et al. (1999) theory of Bounded Generalized Reciprocity. Further elaboration is needed here if we are to assess the evolution of reciprocation over a considerable period of time in particular.

In evolutionary models, reputation is one of many signs that signals the way in which an individual is likely to act in social interactions. These signs could relate to various facets of behaviour, such as skill or dominance (Tennie, Frith, & Frith, 2010). This study however, focuses on behaviour in reciprocal interactions, and on reputation as an indication of the level of cooperativeness and willingness to reciprocate in various types of interactions, such as intergroup interactions, interactions amongst unequal groups as well as groups, and under various normative scripts. In these contexts, Tennie et al. (2010) and Yamagishi et al. (1999) argue that reputation plays a fundamental part in sustaining social cohesion. It provides incentive tools that reduce uncooperative behaviour, behaviour that goes against the expected and prevailing behaviour within the group, and influences the decisions of individuals in these social interactions.

Tennie et al. (2010) argue that investigating the management of reputation is especially relevant in a large number of individuals, whereby the large size of the interacting groups increases anonymity, reducing the ability to monitor reputation. This becomes important when it is considered, as Tennie et al. (2010) and Yamagishi et al. (1999) argue, the fact that the benefits accrued from giving are not immediate is a central characteristic of reciprocity. In a reciprocal interaction, a person performs an act that is beneficial for another person, whilst sustaining an expense on themselves with the understanding that they will benefit in the long term. This behaviour could be seen as a type of altruism in the short-term.

The challenge for evolutionary theories is to explain how such cooperative behaviour can evolve. Indirect reciprocity theory argues that cooperative persons benefit in the long run through increased cooperation from others. Here, the pricey initial act is an investment, as it is expected that it will be repaid at a later date (Tennie et al., 2010). In this situation, "…reputation is needed to establish cooperation. Uncooperative behaviour results in a bad reputation, which is associated with several disadvantages. As a result, reputation is a

stabilising factor, reducing the likelihood of uncooperative behaviour" (Tennie et al., 2010, p. 3). As discussed earlier, individuals decide the "…the subjective consequences of allocation behaviour" based on the context of their interaction (Hertel & Kerr, p. 317). For instance, if an individual is in an intergroup context, based on previous experience they may decide that they will be punished by the ingroup if they favour the outgroup. In this way, individuals decide what behaviour will result in them seeming cooperative.

In individuals displaying reciprocal behaviour, it is probable that there are at least two mechanisms of reputation and reputation management, a mechanism that offers a foundation for choosing appropriate partners and another mechanism that provides a foundation for rewarding cooperative individuals. Therefore, persons who have acquired a reputation for cooperative behaviour are more likely to be chosen as partners (Sylwester, & Roberts, 2010), while individuals with a bad reputation are more likely to be ignored and excluded. These mechanisms provide strong motivation to be cooperative, even for individuals with a natural tendency to be uncooperative (Tennie et al., 2011).

Direct examinations of cooperative behaviour or of the signs of this behaviour are a key source for verifying an individual's reputation. The 'audience effect' hints that the person that is under scrutiny automatically account for individuals in the environment who are potential partners of the future. Social animals, who invest in others, send out signs favourable to them by cooperating with other individuals, but will not do so when unobserved. These signs come at a cost in the short term, and as the cost rises, so should the level of the enhancement of the reputation. Expensive reputation boosting actions tend to happen in the case where there are a number observers are present who not only can take note of the behaviour, but can also reward the behaviour at some point. Similarly, reputation-harming actions, for example, individuals who are uncooperative are more likely to be punished by other individuals. It is therefore not surprising that this behaviour, that is reputation harming, is more popular amongst individuals when no audience is present or there is anonymity (Tennie et al., 2011). Thus Tennie et al. (2011, p. 3) argue that, "The audience effect and effects of anonymity are two sides of the same coin, working in opposite directions. When there is anonymity, and this is often the case with large groups, it is hard to track individual reputation, and free riders can invade more easily. Removing anonymity and reinstating an audience will allow reputation to be acquired again, and will

lead to increases in cooperation". Reciprocation will evolve in a way that allows individuals to maintain a good reputation.

Punishment

The propensity of individuals to act in ways that maintain a good reputation hinges on other individuals' willingness to punish them if they don't. Gintis (2000) argues that a significant number of individuals have a tendency to punish other individuals who fail to cooperate in a social dilemma even at a cost to themselves in the short term. The basis of this behaviour could be because individuals believe in reciprocating harm for harm, with little regard for the implications that may have for their own gains. An individual may thus engage in altruistic punishment because they are inequality-averse, meaning they are willing to punish individuals who do not cooperate in order to create a more equal allocation of resources and outcomes even if this may result in lower resources or outcomes for themselves and others. Güth, Schmittberger, and Schwarze (1982) illustrated the propensity that individuals have to punish individuals who do not cooperate. In their experiment, two participants were involved; one of them was given $10. This participant, referred to as the Proposer, was told to offer any number of dollars, from $1 to $10, to the other participant, referred to as the Responder. The Proposer is only allowed to make one proposal and the Responder can either accept or reject this offer. If the offer is accepted by the responder, the funds were split per the proposer's wishes. However, if the Responder rejects the offer, the two participants both receive nothing. The participants do not interact again. The Responder often rejected low offers in order to punish the Proposer, even though this cost them resources. The results also showed that Proposers were less likely to offer low amounts, which may signal an understanding that other individuals are willing to punish selfish behaviour. In a variation of the game where a rejection by the Responder leads to them receiving nothing but the Proposers keeping their share, the Proposers offered significantly lower sums of money. Additionally, when individuals had played the game, they were questioned regarding their reasons for making offers that were acceptable to the receiving participants, Proposers frequently stated that they were fearful that the receiving participants would reject an offer that they felt was unacceptable and they, the Proposer, would receive nothing. When the receiving participants rejected offers, they often stated that they wanted to punish unacceptable behaviour (Gintis, 2000).

Third person altruistic punishment has also been observed. It has been shown that persons are prepared to confer favours on individuals who conform to what is expected of them in social interactions, as well as punish individuals who do not, even in situations where they are not personally assisted or harmed by the person's acts. In everyday life, third party individuals who are not the recipients of another person's pro-social act, assist the person in times of need, preferentially exchange favours with the person in ways that may be costly to the giver. Likewise, third party individuals who have not, themselves, been harmed by the behaviour of a person, may decline to assist even when it is not costly to do so, shun the reprobate, and approve of the offender's ostracism from beneficial group activities, again at low cost to the third party but at high cost to the offender (Gitis, 2000). Shinada, Yamagishi, and Ohmuda (2004) also found that third party individuals are even more likely to punish ingroup members who do not favour other ingroup members in the dictator game. Jordan, McAuliffe, and Warneken (2014) found similar results.

The propensity of individuals to punish other individuals if they do not act how they are expected to act (i.e. based on their reputation) has the ability to influence reciprocation now and in the future. If individuals know what is expected of them they will act in that way so that they do not get punished. If, however, individuals change their behaviour and go against what is expected of them, reciprocation will also change. This therefore results in the evolution of reciprocation when interaction occurs over time. This study argues that as individual become surer of what is expected of them through reinforcement, the norms that develop will become stronger (i.e. ingroup or outgroup reciprocation will strengthen) as individual will prescribe more to the behaviour that is reinforced.

The propensity of norms to develop through individuals' beliefs about what is expected of them and the punishment or rewarding of individuals based on reputation has been shown to be present in various contexts. There is, however, some evidence suggesting that some norms are more likely to develop than others. Feldman (1984) argued that in intergroup contexts, those norms that are of a utilitarian value to the ingroup re most likely to develop. Feldman (1984, p. 48) stated that "…a group will enforce norms that facilitate its very survival". The enforcement of norms that are beneficial to the ingroup are also enforced more strongly than other norms. Therefore, individuals are more likely to be punished or rewarded for deviating or adhering to these norms (Feldman, 1984).

Reciprocation

In addition to being beneficial to the individual, building a good reputation amongst ingroup members and thus increasing the likelihood of future ingroup favour (Yamagishi et al., 1999), ingroup favouritism and reciprocation is also beneficial to the ingroup because it maintains the resources within the group. The norm of ingroup reciprocation is more beneficial to the ingroup than the norm of fairness and equality (as these require more reciprocation to the outgroup) and therefore more likely to develop. This study will seek to examine whether the evolution of reciprocation is also influenced by how beneficial it is to the ingroup.

Martin Nowak and Karl Sigmund have been the most prominent scholars to study the evolution of reciprocation with the use of game theory (Nowak & Sigmund, 2005; Nowak & Sigmund, 1998a; Nowak & Sigmund, 1998b; Ohtsuki, Iwasa, & Nowak, 2009; Nowak, 2006; and Brandt, & Sigmund, 2006), particularly with evolutionary game theory. Evolutionary game theory refers to the use of game theory to study the evolution of reciprocation and other forms of interdependence. Nowak and Sigmund (1998a) built on the work of Trivers (1971) and Axelrod and Hamilton (1981). In his seminal work, Trivers (1971) suggested reciprocal altruism (or direct reciprocity) that stimulates cooperation among a dyad of individuals interacting repeatedly. This thinking was solidified in the repeated prisoner's dilemma game conducted by Axelrod and Hamilton (1981). In the work of Nowak and Sigmund, an evolutionary stable tit-for-tat strategy was found. Meaning that individuals reciprocated to cooperative individuals throughout the game. The work of Axelrod and Hamilton (1981) is an example of the study of the evolution of direct reciprocity. In contrast, indirect reciprocity explains cooperation even in situations where the same dyad of individuals are not interaction repeatedly. Nowak and Sigmund (1998a) argued that, with the help other individuals' reputation, an individual comes to understand who they should or should not cooperate with. The logic is if non-co-operators are effectively excluded by this method, cooperation can be strengthened. Nowak and Sigmund (1998a) investigated the evolution of indirect reciprocity with the use of the concept of image scores. An image score is "…a binary illustration of an individual's social reputation and is either good or bad" (Ohtsuki & Iwasa, 2006). In their experiments (Nowak & Sigmund, 1998a), individuals had one shot interactions over several rounds with randomly selected individuals in each round. If an individual gave help to others, their image score increased, becoming positive.

Inversely, not helping resulted in a bad image score for the individual. Under this updating rule, Nowak and Sigmund found that what they called the discriminator strategy, where individuals give help to those individuals with good reputation and punish those with poor reputations, was most prominent. Much of the recent research on the evolution of reciprocation has relied on mathematical modelling (Roberts, 2015; Ghang & Nowak, 2015; van Doorn, & Taborsky, 2012; and Voelkl, 2015) due to the limitations of conventional methods of studying reciprocation and its evolution, which are discussed below. These mathematically modelled studies have generally found stronger levels of cooperation compared to those of Nowak and Sigmund (1998a), suggesting that the limitations discussed below matter. For instance Roberts (2015) found that a more realistic model resulted in individuals cooperating 96.07 % of the time compared to only 52.46 % of the time when the methods of Nowak and Sigmund were used. These findings emphasize the importance of more realistic methods of social psychological experiments (such as those discussed below, see viappl.org). Additionally, these evolutionary studies and models have largely focused on the evolution of inter-individual reciprocation. In light of the work of Thibaut and Kelley (1959) as well as Yamagishi et al. (1999), which was discussed earlier and which illustrated how the formation of groups can reformulate the dynamics of reciprocation, this study seeks to assess the evolution of group-based reciprocation in intergroup contexts, under various normative scripts, and under unequal groups.

Game Theory and the Study of Interdependence and Reciprocation

Game theory is, "…the study of mathematical models of conflict and cooperation between intelligent rational decision-makers" (Myerson, 1991, p. 1). Evolutionary game theory refers to game theory employed to study the evolution of these phenomena (see Nowak & Sigmund, 1998a and Nowak & Sigmund, 1998b). Game theory is usually employed in psychology, economics, and political science to study rational decision-making. In recent times, various forms of game theory have been used to study reciprocation and its evolution, ingroup favouritism, and interdependence in the minimal group situation. Balliet, Wu, and De Dreu (2014) offer a succinct review of these methods.

One of these is the dictator game; this is a game where there is a dictator and a recipient playing. A dictator is given a certain amount of money and then they are meant give some or all of to a recipient. In this case, the recipient does not have any influence on the

dictator's decision. Thus, it would be in the self-interest of the dictator would be to keep all the money. The dictator either gives money to an ingroup or outgroup member and is sometimes played sequentially interchanging roles to assess indirect reciprocity (Balliet, Wu, & De Dreu, 2014).

The trust game is also used. In this case, individuals are either an investor or a trustee. Here, the investor invests a certain amount of money by giving it to the trustee, this money is then tripled by the experimenter. The trustee decides how much of the money they return to the investor. The investor needs to decide how much risk to take (i.e. how much money to invest) as the trustee can either be selfish and keep all the money or be generous and give a significant portion of it back. Individuals either play with ingroup or outgroup members.

Social dilemma games such as the prisoner's dilemma game, public goods dilemmas, and resource dilemmas have also been used. For instance, in the prisoner's dilemma game, two individuals simultaneously decide how much of their endowment (e.g., 10 euros) to give to their partner. Because any amount provided to their partner is doubled, both individuals would be better off if both decided to cooperate, rather than not. However, similar to the dictator game, there is the greedy temptation to keep one's endowment. As in the trust game, there is the fear that one's cooperation may be exploited by a greedy partner. In the study of the evolution of phenomena, such as reciprocation, these games are played sequentially. Much of the literature regarding reciprocation, reputation, and punishment has focused on ingroup favouritism (Yamagishi et al., 2012). This study seeks to assess the influence of group dynamics as well as various normative scripts and inequality on reciprocation and its evolution over time.

A concern with employing traditional methods of game theory in studying reciprocation and its evolution is that the assumptions made in these games differ significantly from "…the observed structure of real interactions" (van Doorn & Taborsky, 2012, p. 1). For instance, individuals are typically not limited to interacting repetitively with the same partner, nor do their societal exchanges happen at random (Whitehead, 2008; van Doorn & Taborsky, 2012) as they have been depicted in studies employing traditional methods of game theory and evolutionary game theory (Nowak & Sigmund, 2005; Nowak & Sigmund, 1998a; Nowak & Sigmund, 1998b; Ohtsuki, Iwasa, & Nowak, 2009; Nowak, 2006; and Brandt & Sigmund, 2006). These games are dyadic in nature and do not allow for a generalized interaction.

Generalized reciprocity and reputation cannot be observed in this situation as group of individuals cannot effectively observe the actions of other individuals and form opinions regarding those individuals' reputations as well as have the opportunity to react accordingly. The image scoring method of Nowak and Sigmund (1998a) discussed earlier addresses some of these concerns in that it offers a tangible reputational reference based on previous actions for each partner an individual interacts with. The limits of this method is that an individual cannot directly observe the actions of other individuals and more importantly, an individual does not choose their partner since they are assigned randomly in each round. Ultimately this method is also limited in that it does not allow for a generalized exchange whereby an individual can directly observe the actions of other individuals in a generalized context and make decisions on whom to interact with over time (or rounds). Even more recent studies on the evolution of cooperation are limited in this regard. For instance, in a study on the evolution of cooperation (Dorrough, Glöckner, Hellmann, & Ebert, 2015) participants interacted sequentially with 10 outgroup members and then 10 ingroup members. This study like previous studies does not offer a generalized exchange context where individuals can view the actions of other individuals and make decisions on whom to interact with based on this or partner choice, where individuals can choose who to interact with. This study seeks to offer a platform that allows for this type of interaction.

The Virtual Interaction Application (VIAPPL)

This study employed VIAPPL (see viappl.org), which is an experimental software platform in which the interactional aspects of social life can be realistically assessed in intergroup dynamics (Durrheim et al., 2016). Since social interaction is the foundation of social life this platform allows researchers to test a wide range of social and psychological hypotheses. It allows for the study of evolving social interaction, such as reciprocation. As discussed above, this is often not the case in minimal group situation experiments. In this platform, variables such as group membership, amount of resources, or ties between individuals can be manipulated. Figure 1 represents a screenshot of VIAPPL during a game. Each circle represents a participant, the colours represent the two different groups and the line between two of the actors (tie) is created as one allocates the token to another (Durrheim et al., 2016).

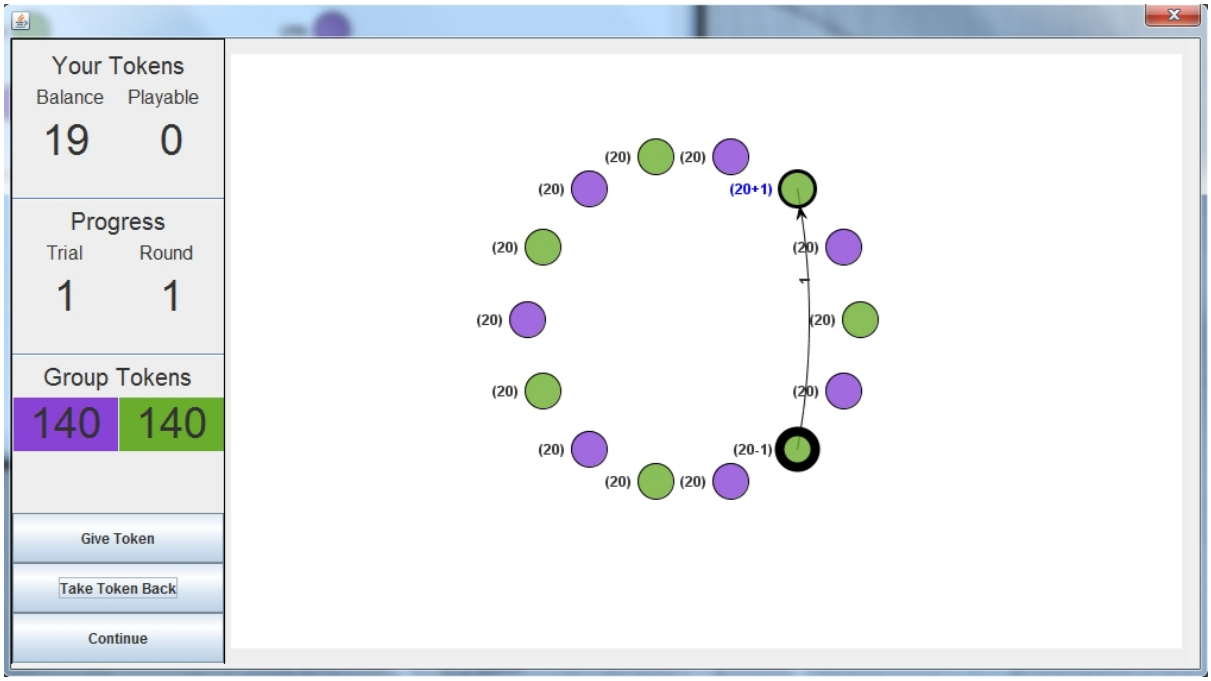

Figure 1:

VIAPPL Platform

VIAPPL allows for the generalized exchange as well as the formulation and evolution of reputation and its influence on reciprocation in various experimental contexts. VIAPPL allows us to take the ideas of Nowak and Sigmund beyond the rigid interaction in their experiments and into a more complex analysis of generalized reciprocity.

Based on the review of the literature conducted here, the following hypotheses are made:

H_1. There will be more ingroup reciprocation than outgroup reciprocation and self-giving.

H_2. Low status groups will show more ingroup reciprocation than high status groups.

H_3. The norm of competition will heighten ingroup reciprocation while the norm of fairness will lower ingroup reciprocation.

H_4. Due to an increase in reputation and the punishment of self and outgroup giving within the generalized exchange context, ingroup reciprocation will become stronger as time progresses in the game.

Reciprocation

It is expected that the above effects will interact. If the is an alignment of the effects, ingroup reciprocation will increase, if there is no alignment, ingroup reciprocation will decrease. For instance, if individuals are playing in a high status and fairness condition, ingroup favouritism will become lower.

Chapter 3 Methodology

This section will discuss the research design, the sampling, data collection, data analysis, ethical considerations, reliability, and validity of this study.

Research design

This study employed secondary data used in a previous publication (see Durrheim et al., 2016 for further details). This study employed an experimental between subjects research design. The experimental software VIAPPL (see review of literature) was used to conduct and collect data used in this study. The VIAPPL experiments were described to the participants as a game.

Individuals participated in one of 72 14-player lab-based experimental games, with each game instantiating one of 12 experimental conditions in a 2(individual, group) by 2(equal, unequal status) by 3(no norm, competition, or fairness norm condition) design. In total each condition had six replications (games). Conditions were played in random order and participants were thereby assigned randomly to conditions. Each game consisted of 40 rounds where individuals were instructed to allocate one token per round to any other individual in the game. The value of the tokens was symbolic as each individual received R20 for their participation in the study irrespective of their final token tally. A structural dependence existed between ingroup, outgroup, and self-giving as a result of the one token per round policy. The cumulative tokens given by each individual over the forty rounds was thus forty for each individual.

The independent variables of this study were Group Context, Status, Norm Condition, Time, and Reciprocation Group. The dependant variable was Reciprocity. These experimental conditions were operationalized in the game as follows:

Group Context: Individuals were randomly allocated to either undifferentiated groups or visually distinct groups. In the distinguished groups, where groups were visually distinct, minimal group allocation was random but participants were told that it was based on their

preference for a painting by Klee or Kandinsky. In the individual context, where the groups were undifferentiated, individuals were still allocated randomly to groups but there were no visual cues for group membership.

Status: The status was manipulated independently of the Group Context. Half the games in the group and individual conditions were equal status games and the other half were unequal status games. There were therefore three levels to this condition; the equal status condition (n = 503), where all the participants started with the same number of tokens; the low status (n = 251), where individuals started with less tokens than the high status group; and high status (n= 252), where individuals started with more tokens than the low status groups. In the equality condition, all individuals began with 30 tokens each. In the inequality condition, the low status individuals began with 20 tokens each while the high status individuals began with 40 tokens each.

Norm Condition: In order to actualize the Norm Condition, the verbal memory task developed by Hertel and Fiedler (Gaertner & Insko, 2000) was employed. Individuals took part in the task either to prime either no norm, fairness or competition. Neutral words, such as computer, car and tree, were used throughout the three primes. Only neutral words were used in the control (no norm) condition. Competition was evoked through words such as opponent, hostility, struggle; whereas the fairness prime included words such as balance, justice, and democratic.

Time: The data were divided into 5 waves of roughly equal rounds, the number of tokens to the ingroup, the outgroup, and to self were summed independently. Since this analysis was focused on the consequences of giving, i.e. reciprocation, 39 0f the forty rounds in the game were viable in this regard – allocations in round 1 could not be reciprocations. There were therefore 4 waves of 8 rounds each and one wave of 7 rounds making a total of five waves.

Reciprocation Group: This refers to whether the net reciprocation being averaged for a particular round category was from the out group or the ingroup.

Reciprocity (Dependant Variable): This was operationalized through the net number of tokens reciprocated to an individual in round n + 1 based on that individual's giving in round n. Meaning, if an individual gave to the ingroup in round n, the net reciprocation would be the tokens from the ingroup minus the tokens from the outgroup in round n +1. If, on the

other hand, an individual gave to the outgroup in round n, the net reciprocation would be the token from the outgroup minus the tokens from the ingroup in round n + 1. If individuals gave to themselves in round n, the net reciprocation in round n + 1 was considered as structurally missing. The net reciprocation in the 39 rounds of each game was then averaged to create five chunks, referred to as waves, of net reciprocation for each individual (See Appendix 2).

In operationalizing reciprocation, particular attention was paid to the fact that group-based reciprocation is confounded with simple ingroup favouritism (see review of literature). When individuals are giving to the ingroup, they could be reciprocating favour or simply giving to the ingroup irrespective of previous actions. By operationalizing reciprocation as relative giving from the ingroup and outgroup in round n + 1 based on an individual's giving in round n (i.e. as net reciprocation), the measure used (Reciprocity) reflects the effect of the immediately preceding allocations in addition to basic ingroup favouritism (i.e. reflects group-based reciprocation).

Sampling

The original study employed convenience sampling in order to sample students of the University of KwaZulu-Natal. This was the most feasible method because of the large number of participants needed for the quantitative study. Convenience sampling allows researchers to obtain a sample in a timeous and inexpensive manner. Demographic factors were not of interest in the particular study. These were therefore not of interest in the sampling phase.

1005 University of KwaZulu-Natal students were sampled (490 female, 476 Male; 855 Black, 27 White, 49 Indian, 32 Coloured). The study was approved by the Human Sciences Research Ethics Committee of the University of KwaZulu-Natal (see Appendix 1). All the participants gave written informed consent. The anonymity of the participants was maintained as none of the participants could see the other participants because of the virtual nature of the experiments.

Data collection

This study employed secondary data collected in 2013. The data were collected by colleagues who were also basing their studies on the VIAPPL programme. The data were collected at the Psychology Lab at UKZN. A network of computers was used to run experiments. The experimenter set up the number of players, rounds, and the type of game in the particular experiment. The participant then gave informed consent and then logged on to the game. Participants allotted a single token each round. This information was saved on the programme, logging the sender, receiver and the group that each belonged to, as well as the trial and round number and the conditions of each trial.

Reciprocation

Data analysis

Quantitative data were employed in this study. The data were recorded on to the VIAPPL software and then exported to Excel. In each of the games, the participants were playing in either a status condition (equal or unequal), in a group condition (individual or group context), in a norm condition (no norm, norm of competition, or norm of fairness) or a mixture of the conditions. The following data were exported from the VIAPPL platform into Excel:

- the tokens that the individuals gave to the ingroup, to the outgroup, and to themselves
- the tokens individuals received from the ingroup, the outgroup, and from themselves
- the cumulative tokens
- and the starting and ending tokens of each participant in each round.

The data were then imported into the statistical package R for restructuring and analysis (See Appendix 2). All the excel files of the various games were combined to formulate one dataset. Using procedures in R, the data were then lagged so that the allocations of round n were aligned with the tokens received in round n+1. The variable Net Reciprocation was formulated from the data collected in the experiment. This tells us how many net tokens an individual received from the group they gave to in the previous round. If for instance, an individual gave a token to the outgroup and they received 0 tokens from the outgroup and 2 tokens from the ingroup, the net reciprocation would be -2. As seen in the formula below:

$$Net\ Reciprocation\ (round\ n) = (Tokens\ from\ the\ group\ given\ to\ in\ round\ n-1) - (Tokens\ from\ the\ group\ not\ given\ to\ in\ round\ n-1)$$

From this, the Net Reciprocation variable was averaged out to create five waves of equal numbers of rounds. This created the ultimate outcome variable, Net Wave Reciprocation. This was separated into ingroup and outgroup reciprocation. This outcome variable was employed the interest of this study was the levels of ingroup and outgroup reciprocation (i.e. group-based reciprocation) rather than inter-individual reciprocation because of arguments and evidence showing how groups can influence reciprocation (Thibaut & Kelley, 1959; Yamagishi et al., 1999).

A linear multilevel model was employed in this study. A linear multilevel model builds on the simple linear model while also accounting for characteristics in the data. This assists in the interpretation and conclusions of the research study (Oberg & Mahoney, 2007). Regression as well as general linear models are tremendously valuable and dynamic methods of statistical modelling. These methods can be employed to test hypotheses on correlation, treatment effects and interactions, and for estimation of means. Basic regression and linear models assume that the residuals are independently and identically distributed as N. This supposition suggests that the residuals need to

have a constant variance across the entire response variable as well as a mean of 0. Additionally, "…it is assumed that residual or unexplainable error is the only source of random variability" (Oberg & Mahoney, 2007, p. 214). Yet, as Oberg and Mahoney (2007) point out, in practice, a significant portion of experiments will not satisfy these assumptions. As a result of the research design or the data collection process, correlation amongst observations or multiple causes of random variation past that of the residual error may emerge. These features, correlation and multiple sources of error, are likely to result in inefficient and possibly deceptive research conclusions if basic regression or linear models are employed. In this study, multiple games were conducted which had the same condition (e.g. individuals played in distinguished groups, under the norm of fairness, and within unequal groups in more than one game) and multiple waves were experienced by each individual. These aspects added an error component to the analysis that was not random. As a result, a number of supplementary tools are necessary to reach the correct conclusions (Oberg & Mahoney, 2007).

Linear multilevel models are potent and valuable methods across several applications and can be employed to tackle several study objectives (Oberg & Mahoney, 2007). In this particular study, linear multilevel models were employed to account for the non-random residual error caused by factors resulting from the data collection process – i.e. the multiple games which had the same condition as well as the multiple waves experienced by each participant in the study. The token giving was nested (1) in waves, (2) repeated by individuals, who, in turn, were (3) nested in games.

Ethical Considerations

Participants were offered a monetary incentive to participate in the experiments. Participation in the experiments was voluntary. Individuals were informed that they were grouped by painting when they were actually grouped randomly. Those who agreed to participate signed informed consent forms

Confidentiality was guaranteed as participants remained anonymous. While participants logged in using their student number and LAN password this information was not linked to their results. It was stated in the informed consent form that the data collected in the experiment would not be destroyed and may be used in future research.

Reliability

Since the data that were used in this study were collected in an experimental setting, there is an expectation that the same results would be acquired in the same experimental context.

Reciprocation

Validity

The data that were used in this study were collected in an experimental context, the internal validity of the study is strong. Although, some threats to internal validity were observed. In particular, the repeated testing of the individuals over the 40 rounds of the game had the potential to confound the results due to fatigue that has been observed in repeated testing, particularly in computer-based exercises (see Savage & Waldman, 2008). Hess, Hensher, and Daly (2012) have however shown that fatigue may not have as significant an impact on final outcomes as first thought. Different experimenters were used in the various games which assisted in controlling for experimenter effect. This however, extenuated the incontinency in the context across the game. Multilevel models were, however, employed to mitigate these shortcomings.

The external validity of the study is relatively weak due to the high control of the experimental situation. This study should, however, have stronger external validity compared to other minimal group experiments (Tajfel et al., 1971; Yamagishi et al., 1999). This is due to the generalized exchange context that is made possible by the VIAPPL platform and which more accurately represents real world exchanges allowing for greater generalization beyond the experimental condition and to real world interactions. Previous minimal group experiments have not provided this due to methodological limitations.

Additionally, selection bias (Heckman, Ichimura, Smith, & Todd, 1998) may also be a threat to external validity with regards to this study. All the participants involved in this study were students at the University of KwaZulu-Natal. Using these participants in this study made logistical sense and meant a large number of participants could be accessed with ease – as the lab in which the experiments were conducted is located at the Pietermaritzburg campus of the University of KwaZulu-Natal. This makes it difficult to generalize these results beyond this specific population, the University of KwaZulu-Natal students. Much has been written on the unreliability of university students as a representative sample of the general population, particularly in social psychological research (see Peterson, 2001; Sears, 1986; & Henry, 2008).

Chapter 4 Results

A mixed effects model using maximum likelihood estimation was run using the program R. The token giving was nested (1) in waves, (2) repeated by individuals, who, in turn, were (3) nested in games.

An analysis of token allocation in round n and the tokens received in round n + 1 illustrates the effects of group-based reciprocation over and above ingroup favouritism. Even though the probability of an individual receiving a token from the ingroup in round n + 1 when individuals were in distinguished groups was relatively high even when individuals gave to the outgroup or to themselves in round n, the probability of receiving from the ingroup was highest when individuals gave to the ingroup. This suggests that even though simple ingroup favouritism is a factor, group-based reciprocation is also a factor. The probability of receiving a token from the outgroup in round n + 1 when individuals gave to the outgroup in round n was highest in undistinguished groups and lower in distinguished groups. This suggests that the presence of distinguished groups limit outgroup reciprocation. The probability of an individual giving to themselves in round n + 1 was highest when individuals gave to themselves in round n, both in distinguished and undistinguished groups. This suggests that self-giving may be constant throughout the game.

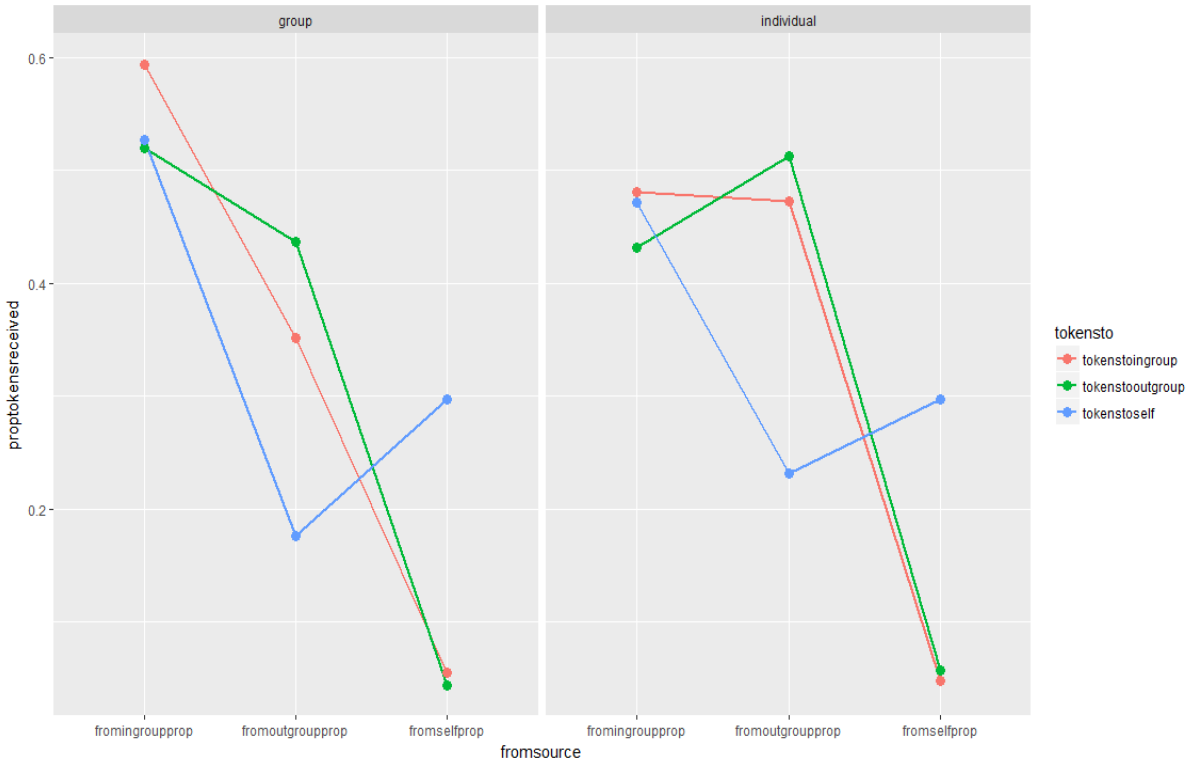

Figure 2: Ingroup, outgroup, and self reciprocation

This study assessed the levels of ingroup and outgroup reciprocation. Reciprocity could either be positive or negative. A negative reciprocity means that an individual was more likely to be favoured by the group they had not given to than the group they had given to. A positive reciprocity means that an individual was more likely to be favoured by the group they had given to than the group they had not given to. Overall, the mean reciprocity was 0.053 – meaning that individuals were likely to be favoured more by the group they gave to. The mean ingroup Reciprocity was 0.131 and the mean outgroup reciprocity was -0.030. This means that when individuals gave to a member of the ingroup, they - on average - received more from the ingroup and that when individuals gave to the outgroup, they – on average – received less from the outgroup.

The effects of Group Context, Norm Condition, Status, Time, and the Reciprocation Group (Independent Variables) on Reciprocity (Dependant Variable) were assessed. Ingroup and outgroup Reciprocity was roughly normally distributed although ingroup Reciprocity was slightly negatively skewed (See Figure 3). A control for autocorrelation, CorAR1, was also added to the model in order to account the successive nature of the game (Gałecki & Burzykowski, 2013).

Reciprocation

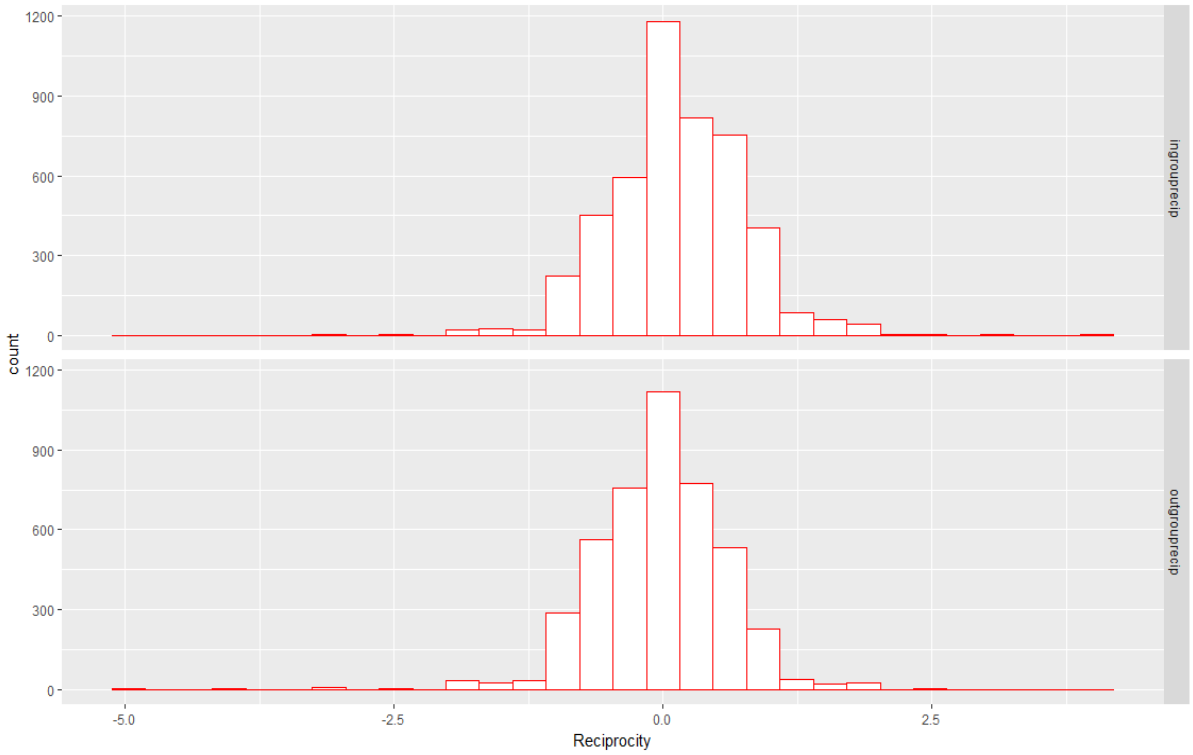

Figure 3:

Distribution of the levels of ingroup and outgroup reciprocation

A multilevel model was used due to the nested structure of the some of the factors. The token giving was nested in individuals, who, in turn, were nested in games. Multilevel modelling deals with the nested factors by randomizing the intercepts and slopes in a regression analysis (Browne & Rasbash, 2009). Hence, in this case, the intercepts and slopes of the game in individuals was randomized. Meaning that each individual and each game had their own slope and intercept (McCulloch & Neuhaus, 2001).

A comparison of the goodness of fit of the fixed effects model and the random effects models was conducted. Firstly, the fixed effects model was compared to a model with random game effects. The comparison illustrated that the random effects model was significantly better than the fixed effects models. The random effects (AIC = 16912.41) improved the goodness of fit significantly when compared to the fixed effects model (AIC = 16932.99, LRatio = 22.57675, Df = 2, p = 0.000). Second, the random game effects model was compared to a model with random game and individual effects. The goodness of fit of the random game and individual effects model (AIC = 16914.14) was not significantly different when compared to the random game effects model (AIC = 16912.41, L.Ratio =

0.000, Df = 3, p = 0.998). An analysis of the impact autocorrelation on the goodness of fit of the model was conducted by comparing a model with the random game and individual effects and a model with random game and individual effects as well as a control for autocorrelation, corAR1. The analysis illustrated that the addition of the control for autocorrelation (AIC = 16605.41, L.Ratio = 164.844, Df = 2, p = 0.000) significantly improved the goodness of fit when compared to the randomized game and individual effects model. It was thus decided that the model with random game and individual effects as well as the control for autocorrelation would be employed in further analysis.

Due to the random factors in the model and based on the work of Nakagawa and Schielzeth (2013) as well as Johnson (2014), a Pseudo R-Squared was calculated in order to establish the portion of variance in the responses accounted for by the factors in the model. The Pseudo R-Squared of the model when it did not account for the random factors was $R^2_{\text{fixed model}} = 0.059$ while for the random model $R^2_{\text{random model}} = 0.063$. This suggest that the random factor improved the predictive capacity of the model.

An analysis of the residual plots (X axis: fitted values versus Y axis: standardized residuals) illustrated that the distribution of the residuals were randomly distributed and there was no discernible pattern. This suggests that there are no additional factors not accounted for that have an influence on the model (Chantarangsi, Liu, Bretz, Kiatsupaibul, & Hayter, 2016). There were also relatively few outlying residuals, with a large majority of the residuals lying between two standard deviations below zero and two standard deviation above zero (See Figure 4).

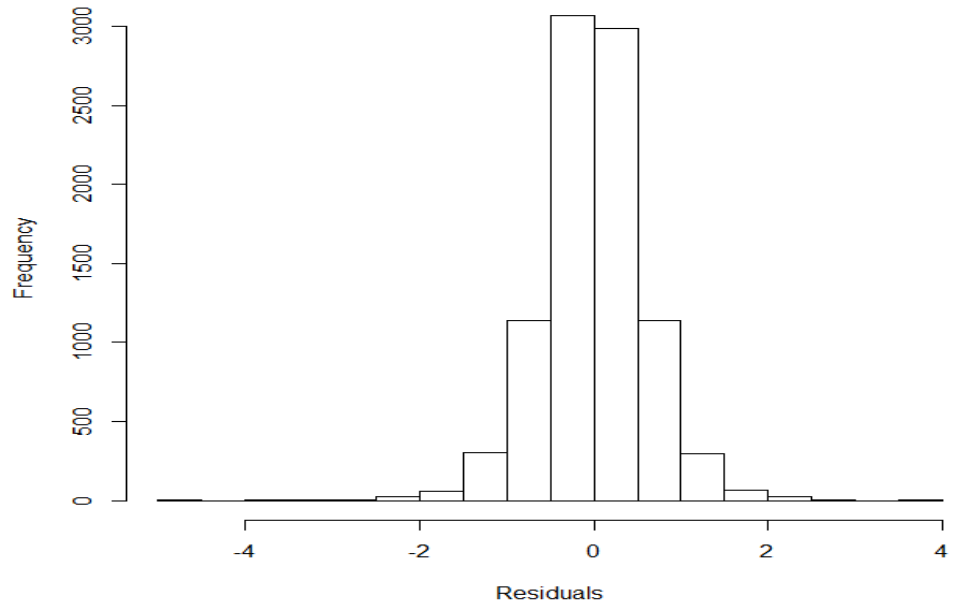

Figure 4: Residuals

An analysis of variance (anova) analysis of the mixed model illustrated that there were no significant five way or four way interactions at 0.05 (See Table 1). There was a single significant three way interaction between the Reciprocation Group, Group context, and the Norm Condition (Chisq = 8.4897, Df = 2, p = 0.01434). Two way interactions between Round Category and the Reciprocation Group (Chisq = 43.3780, Df = 4, p = 0.000) as well as the Reciprocation Group and Group context (Chisq = 181.6480, Df = 1, p = 0.000) were also significant. The Reciprocation Group was the only main effect that was significant (Chisq = 139.2524, Df = 1, p = 0.000) (See Table 1).

Table 1: Anova Summary

Condition	Chi-Square	Df	P-value
Reciprocation Group	139.2524	1	0.000
Group Context	2.3973	1	0.122
Status	0.7535	2	0.686
Norm Condition	1.2104	2	0.546
Time	7.1007	4	0.131
Reciprocation Group: Group Context	181.648	1	0.000
Reciprocation Group: Status	4.9956	2	0.082
Group Context: Status	0.6538	2	0.721
Reciprocation Group: Norm Condition	4.6995	2	0.095
Group Context: Norm Condition	0.4011	2	0.818
Status: Norm Condition	4.0124	4	0.404
Reciprocation Group: Time	43.378	4	0.000
Group Context Individual: Time	2.9666	4	0.563
Status: Time	5.3524	8	0.719
Norm Condition: Time	6.9135	8	0.546
Reciprocation Group: Group Context: Status	0.467	2	0.792
Reciprocation Group: Group Context: Norm Condition	8.4897	2	0.014
Reciprocation Group: Status: Norm Condition	3.3889	4	0.495
Group Context: Status: Norm Condition	5.8315	4	0.212
Reciprocation Group: Group Context: Time	2.6743	4	0.614
Reciprocation Group: Status: Time	6.3162	8	0.612
Group Context: Status: Time	5.6284	8	0.689
Reciprocation Group: Norm Condition: Time	6.7499	8	0.564
Group Context: Norm Condition: Time	1.8767	8	0.985
Status: Norm Condition: Time	9.8325	16	0.875
Reciprocation Group: Group Context: Status: Norm Condition	3.8635	4	0.425

Reciprocation

Reciprocation Group: Group Context: Status: Time	11.484	8	0.176
Reciprocation Group: Status: Norm Condition: Time	9.224	16	0.904
Group Context: Status: Norm Condition: Time	12.5421	16	0.706
Reciprocation Group: Group Context: Status: Norm Condition: Time	3.9764	16	0.999

Table 2 illustrates the mixed effects. An analysis of the main effects shows that the Reciprocation Group has a significant effect on reciprocation and illustrates a group-based reciprocation bias (i.e. individuals are more likely to reciprocate to members of their own group than outgroup members). The results show that reciprocation to the outgroup (mean = -0.030) is significantly lower than reciprocation to the ingroup (mean = 0.131) (p = 0.000, t-value = -8.096864, std. error = 0.041, Df = 8114, coef. = -0.335) (See Table 2). The means illustrate that when individuals give to the ingroup, they are – on average – likely to receive more from the ingroup than the outgroup (mean = 0.131). When individuals give to the outgroup, the are – on average – likely to receive less from the outgroup than the ingroup (mean = -0.030).

The main effect of Group Context also had a significant effect (p = 0.000, t-value = -6.969, std. error = 0.037, Df = 66, coef. = -0.258) (See Table 2). The results show that individuals reciprocate significantly less when they are playing in an Individual context (mean = 0.037) then when they are playing in distinguished groups (mean = 0.070). The means illustrate that individuals are – on average – likely to receive more from the group they gave to when they are playing in distinguished groups (mean = 0.070) and Individual context (mean = 0.037) but that what they receive is higher in distinguished groups.

An analysis of the interaction effect between Group context and the Reciprocation Group illustrated a significant effect (p = 0.000, t-value = 9.517, std. error = 0.047, Df = 8114, coef. = 0.448) (See Table 2). The results show that, when individuals are playing in distinguished groups, they are significantly more likely to reciprocate to ingroup members (mean = 0.260), and less likely to reciprocate to the outgroup (mean = -0.118) illustrating a group-based reciprocation bias. The means illustrate that when individuals are in distinguished groups,

they receive more than they gave if they gave to the ingroup (mean = 0.260) and receive less than they gave if they gave to the outgroup (mean = -0.118). When individuals were playing in the individual context, they received more than they gave when they gave both to the ingroup (mean = 0.027) and the outgroup (mean = 0.047). This again illustrates the influence of distinguished groups in promoting group-based reciprocation bias.

The main effect of the Norm Condition is significant. The results show that individuals playing in both the condition of fairness (mean = 0.037) and the no norm condition (0.057) reciprocate less than individuals in the condition of competition (mean = 0.063). The norm of fairness was, however, the only one that was significant, showing that the only significant difference was between fairness and competition manipulations (p = 0.003, t-value = -3.126, std. error = 0.037, Df = 66, coef. = -0.115) (See Table 2). The two way interaction between Group context and Norm Condition shows that, even though reciprocation was still higher in distinguished groups, the Norm Condition of fairness lowered reciprocation in the distinguished groups when compared to the other Norm Conditions (p = 0.033, t-value = 2.183, std. error = 0.052, Df = 66, coef. = 0.114, see figure 5) suggesting that fairness reduces group-based reciprocation bias. The means illustrate that in distinguished groups, individuals received more than they gave in all three norm conditions (no norm = 0.073; fairness = 0.048; competition = 0.089) but that they received the least in the Norm Condition of fairness. The same was true in the Individual Context (no norm = 0.043; fairness = 0.028; competition = 0.039).

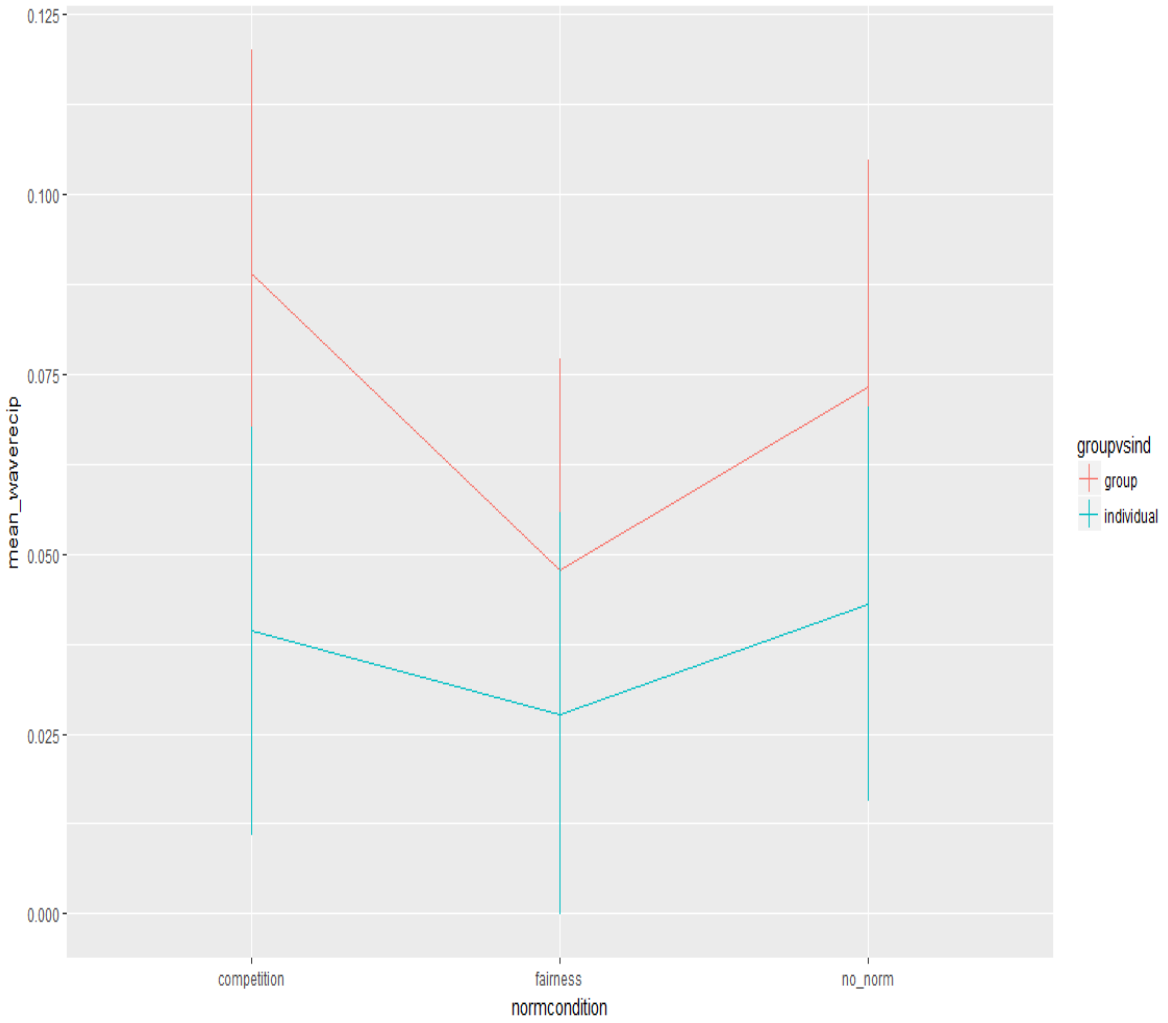

Figure 5: Fairness moderating group-based reciprocation bias

Additionally individuals were also seen to reciprocate more to the outgroup in the Norm Condition of fairness compared to the Norm of competition (p = 0.000, t-value = 3.586, std. error = 0.047, Df = 8114, coef. = 0.170) (See Table 2). The means illustrate that when individuals gave to the outgroup, they received less than they gave in all three conditions (no norm = -0.027; fairness = -0.025; competition = -0.037). When individuals gave to the ingroup, they received more than they gave in all three conditions (no norm = 0.136; fairness = 0.098; competition = 0.158).

The above was qualified by the three way interaction between Group Context, Norm Condition, and Reciprocation Group which shows that individuals still reciprocate more to the ingroup in distinguished groups but that the Norm Condition of fairness moderates ingroup reciprocation (See Figure 6), significantly lowering it, while competition strengthens it (p = 0.005, t-value = -2.825, std. error = 0.066, Df = 8114, coef. = -0.187) (See Table 2). In

the individual context, there is no difference in the ingroup and outgroup reciprocation when the three normative scripts are considered. Furthermore, the norm of fairness did not significantly moderate ingroup reciprocation. The means illustrate that even though in distinguished groups, when individuals gave to the outgroup, they – on average – received less from the outgroup in all three Norm Conditions. However, the Norm Condition of Fairness increased reciprocation towards the outgroup effectively moderating group-based reciprocation bias while the Norm Condition of Competition heightened it (See Figure 6).

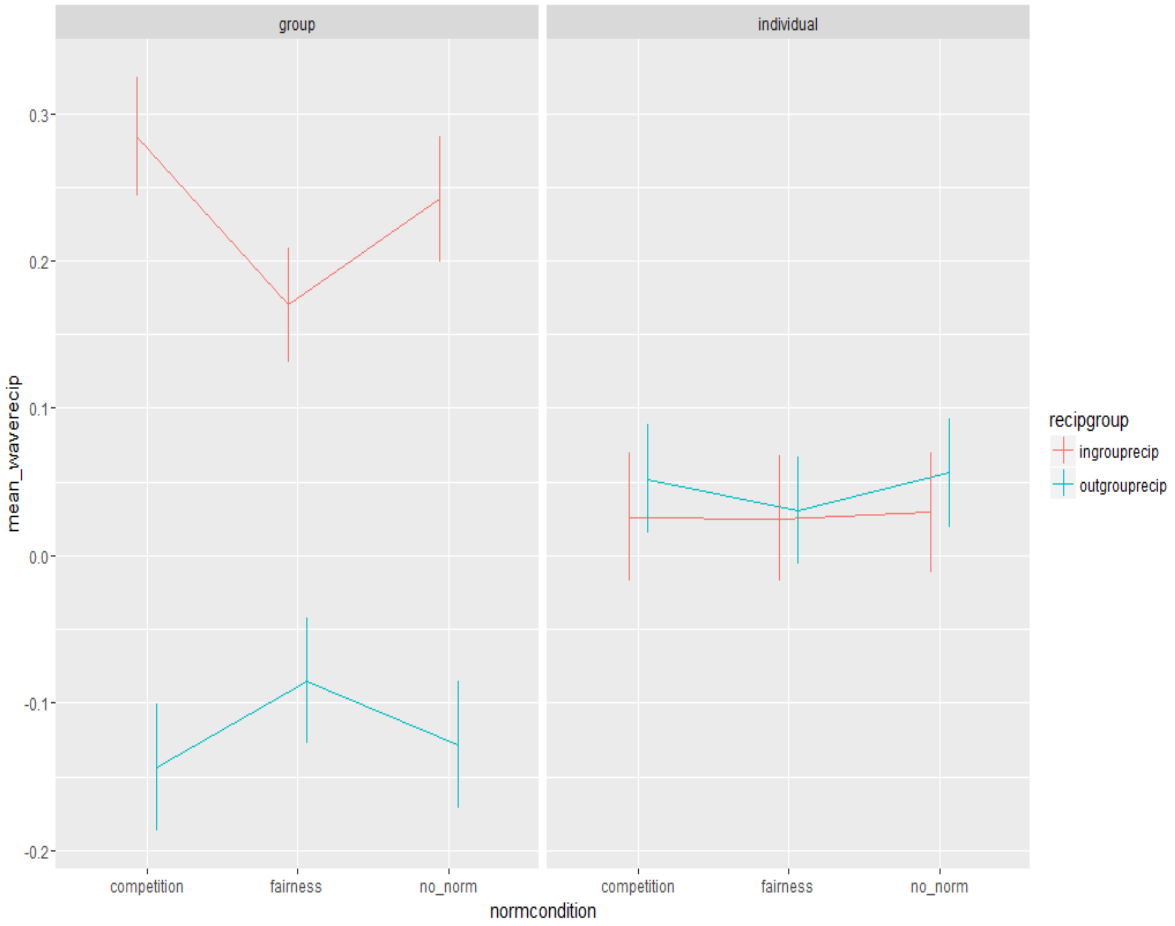

Figure 6: The moderation of group-based reciprocation bias by the norm of fairness

An analysis of Time (round categories) shows that individuals reciprocate more and more as the game progresses, particularly from the second category of rounds onwards. Individuals reciprocate significantly more in the third category (p = 0.002, t-value = 3.088, std. error = 0.027, Df = 8114, coef. = 0.084, mean = 0.064) of rounds than the in the first round (mean = 0.025). They reciprocate significantly more so in the fourth round (p = 0.000, t-value = 3.587, std. error = 0.027, Df = 8114, coef.0.098, mean = 0.071). Reciprocation weakens slightly in

the fifth category of rounds (mean = 0.063) compared to the fourth category of rounds (mean = 0.071), it was still significantly higher than the first category of rounds (p = 0.000, t-value = 5.468, std. error = 0.027, Df = 8114, coef. = 0.150) (See Table 2).

The main effect described above was qualified by a two-way interaction between Reciprocation Group and Time. The interaction between the reciprocation group and the round category illustrates that individuals reciprocate to the ingroup significantly more and significantly less to the outgroup as Time progresses in the game effectively increasing group–based reciprocation over time (See Figure 7). The results show that individuals reciprocate to the outgroup significantly less in the third category (p = 0.017, t-value = -2.384, std. error = 0.039, Df = 8114, coef. = -0.093) of rounds than they did in the first round. The reciprocate even less to the outgroup in the fourth category of rounds (p = 0.004, t-value = -2.891, std. error = 0.040, Df = 8114, coef. = -0.114) and even less so in the fifth category of rounds (p = 0.000, t-value = -5.992, std. error = 0.041, Df = 8114, coef. = -0.243) (See Table 2). The means illustrate that individuals – on average – received more from the ingroup when they gave to the ingroup and received less from the outgroup when they gave to the outgroup and that this was true throughout the game (See Figure 7).

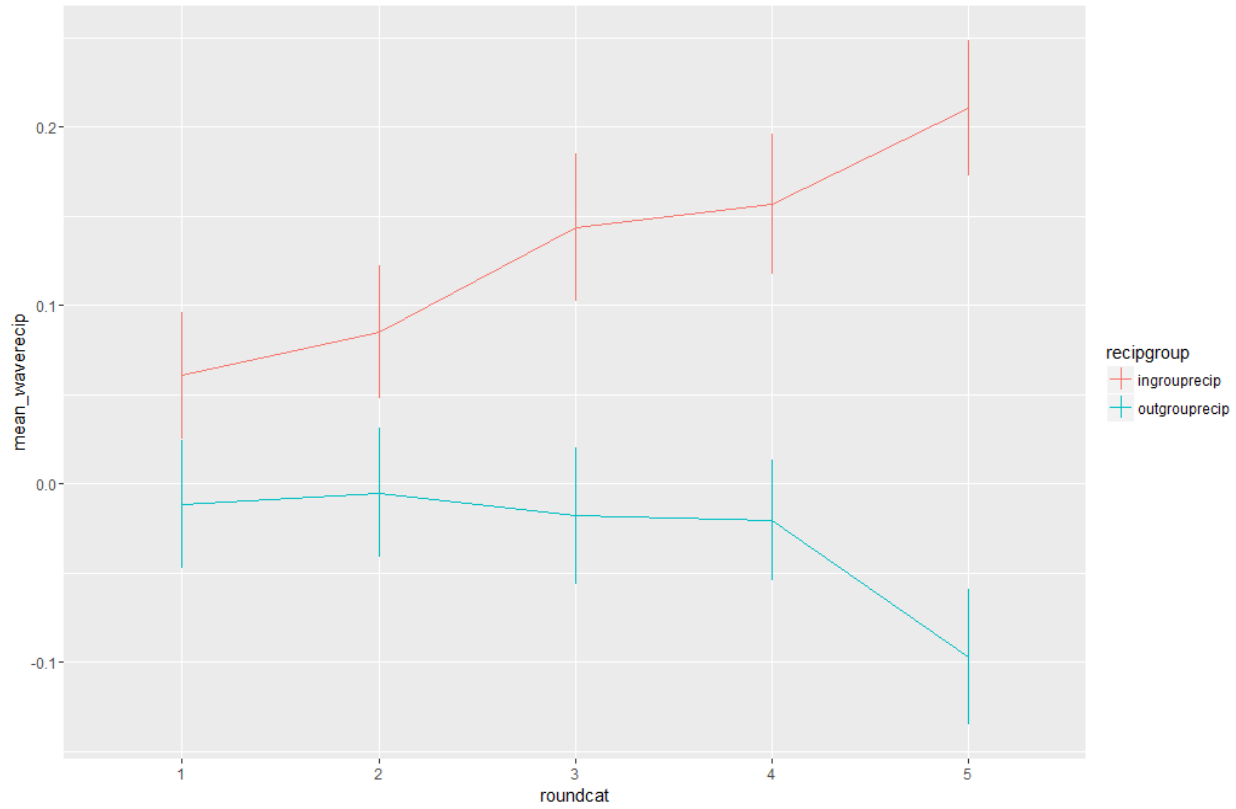

Figure 7: The strengthening of group-based reciprocation bias over time

The Status main effect as well as an interactions involving Status were not significant. This suggests that the relative Status of individuals does not have an influence on the reciprocation of individuals. However, the interaction between Status and the Reciprocation Group was partially significant.

Table 2: Mixed Effects

	Coefficient	Standard Error	DF	t-value	p-value
Intercept	0.214	0.031	8114	6.947	0.000
Reciprocation Group: Outgroup Reciprocation	-0.335	0.041	8114	-8.097	0.000
Group Context: Individual	-0.258	0.037	66	-6.969	0.000
Time: Phase 2	0.026	0.026	8114	1.013	0.311
Time: Phase 3	0.084	0.027	8114	3.088	0.002
Time: Phase 4	0.098	0.027	8114	3.587	0.000
Time: Phase 5	0.15	0.027	8114	5.468	0.000
Norm Condition: Fairness	-0.115	0.037	66	-3.126	0.003
Norm Condition: No Norm	-0.046	0.037	66	-1.248	0.216
Reciprocation Group: Outgroup Reciprocation – Group Context: Individual	0.448	0.047	8114	9.517	0.000
Reciprocation Group: Outgroup Reciprocation – Time: Phase 2	-0.02	0.037	8114	-0.535	0.593
Reciprocation Group: Outgroup Reciprocation – Time: Phase 3	-0.093	0.039	8114	-2.384	0.017
Reciprocation Group: Outgroup Reciprocation – Time: Phase 4	-0.114	0.039	8114	-2.891	0.004
Reciprocation Group: Outgroup Reciprocation – Time: Phase 5	-0.243	0.041	8114	-5.992	0.000
Reciprocation Group: Outgroup Reciprocation – Norm Condition: Fairness	0.17	0.047	8114	3.586	0.000
Reciprocation Group: Outgroup Reciprocation – Norm Condition: No Norm	0.061	0.05	8114	1.279	0.201
Group Context: Individual – Norm Condition: Fairness	0.114	0.052	66	2.183	0.033
Group Context: Individual – Norm Condition: No norm	0.048	0.052	66	0.913	0.365
Reciprocation Group Outgroup reciprocation – Group Context: Individual – Norm Condition: Fairness	-0.187	0.066	8114	-2.825	0.005
Reciprocation Group Outgroup reciprocation – Group Context: Individual – Norm Condition: No Norm	-0.055	0.067	8114	-0.822	0.411

Chapter 5 Discussion

Findings of Study

The aims of this study were to assess how Group Context, Normative Scripts, Status, and the passage of Time influence the levels of group-based reciprocation and its evolution in the minimal group context. In this section, the results of this study will be discussed in relation to the literature discussed earlier.

The results of the analysis supported H1: There will be more ingroup reciprocation than outgroup reciprocation in the distinguished groups, H3: The norm of competition will heighten ingroup reciprocation while the norm of fairness will lower ingroup reciprocation, and H4: Ingroup reciprocation will become stronger over time, but not H2: Low status groups will show more ingroup reciprocation then high status groups. There was group-based reciprocation bias in the distinguished groups, more specifically; individuals reciprocated more to members of their own group. With regards to the normative scripts, ingroup reciprocation was still higher in the distinguished groups when compared to the outgroup. However, the normative script of fairness tended to moderate ingroup reciprocation. Meaning, individuals reciprocated less to members of their own group and more to members of the outgroup in the norm condition of fairness than they did in the no norm condition and the norm condition of competition. The norm of competition strengthened group-based reciprocation in the distinguished groups. This offers support for H3. The analysis showed that group-based reciprocation bias strengthened as time progressed in the game. More specifically, ingroup reciprocation became stronger as time progressed in the game. This supports H4, as this outcome suggests that the reputation of individuals as ingroup reciprocators is reinforced due to early ingroup giving which encourages ingroup reciprocation later, which additionally promotes further ingroup reciprocation. This shows the evolutionary nature of reciprocation in a generalized exchange context. The status conditions were not significant.

Since the time when Malinowski (1932) argued that reciprocation was the “social machinery” on which society was built, many researchers have showed an interest on reciprocation (including Patterson, 1970: Altman, 1973: and Gouldner, 1960). These authors

argued that individuals will help those who can help them in the future and those who had helped them in the past. Malinowski (1932) argued that individuals were operating under the following assumptions: (a) in a prolonged interaction of individuals in the exchange of goods and services, the benefits accrued will balance out between the individuals; or (b) when individuals do not reciprocate the positive actions of others towards them, they will experience negative consequences from other individuals; or (c) there is an expectation that those that they help will help them in the future. Here reciprocation is seen as purely a utilitarian exercise, where individuals will help those who can help them not accounting for group dynamics, status, or the prescribed norms in the interaction.

Gouldner (1960) argued that in addition to this utilitarian motivations of individuals, there is a moral norm of reciprocity that means that individuals feel a moral obligation to help those who have helped them and not hurt those who have helped them.

The results of this study illustrate that reciprocation does not necessarily operate in this way. It has been shown that individuals reciprocate differently when group dynamics are introduced. Even though reciprocation was present overall, the presence of distinguishable groups served to strengthen ingroup reciprocation and largely extinguish outgroup reciprocation resulting in group-based reciprocation bias.

Thibaut and Kelley (1958) pointed out that individuals may reciprocate more towards individuals in their own group, particularly in large and generalized groups, due to a mutual fate control. Yamagishi et al. (1999) built on this understanding and developed the theory of Bounded Generalized Reciprocity. This was anticipated by Rabbie et al.'s (1989). Rabbie and his colleagues' work was some of the earliest on intergroup dynamics and reciprocation in the minimal group situation. This work was a criticism towards Tajfel & Turner's (1985) interpretation of the findings of their minimal group studies. Rabbie et al. (1989) argued that the ingroup favouritism seen in Tajfel et al.'s (1971) minimal group experiments was as a result of ingroup interdependence rather than outgroup discrimination and that individuals would favour whoever could reciprocate. Rabbie et al. (1989) argued for unbounded reciprocation, meaning that individuals will favour and reciprocate to those who can help them in the future. This is similar to the arguments made by Malinowski (1932) and Gouldner (1960).

The theory of Bounded Generalized Reciprocity on the other hand argues the reciprocation is bounded (Yamagishi et al., 1999). This means that individuals are more likely to reciprocate to ingroup members who help them than outgroup members who help them specifically because of the ingroup interdependence pointed out by Rabbie et al. (1989). Yamagishi et al. (1999) argued that individuals are likely to favour ingroup members when reciprocating because they have evolved to do so. It is argued that groups played a fundamental role in the reproduction and survival of individuals. Individuals are usually dependant on group members when group dynamics and are present and defer to this when they are faced with group dynamics and engage in generalized exchange as they do in other group contexts.

The results of this study have shown that the assertions of Malinowski (1932) and Gouldner (1960) - that individuals will reciprocate to those individuals that have helped them and help those that can help them in the future - even though somewhat true, are limited. The findings of this study show that group dynamics can influence group-based reciprocation. Individuals reciprocate more to members of their own group than to members of the outgroup when they are in defined groups. Individuals engage in bounded generalized reciprocity as postulated by Yamagishi et al. (1999). As Yamagishi et al. (1999) pointed out; individuals reciprocate to ingroup members who help them and less so to outgroup members who help them. Reciprocation is not unbounded, as Rabbie et al. (1989) argued, but rather bounded by group membership. This was the case in this study. The findings of this study offer strong support for Yamagishi et al.'s (1999) Theory of Bounded Generalized Reciprocity. The norm of reciprocation changes in the distinguished groups from "I need to help those who help me" to "I should help those closest to me who are most likely to help me in the future".

The normative scripts prevalent also influence reciprocation. An alternative explanation of the results of the original minimal group experiments was that the intergroup dynamics of the minimal group experiments induced a generic norm of cooperation among group members (Berkowitz 1994; Gerard and Hoyt 1974). Building on this, Hertel and Kerr (2000) argued and illustrated that when other norms other than ingroup cooperation are primed, ingroup favouritism can be reduced or heightened depending on the norm primed. They found that ingroup favouritism was heightened when the norm of loyalty was primed; they

also found that ingroup favouritism was lower when the norm of equality was primed. In the latter case, individuals were more likely to favour outgroup members.

The aim of this study was to assess if the priming of different normative scripts would result in individuals reciprocating differently. The norms that were primed in this study were competition and fairness. The results showed that ingroup reciprocation permeated all normative scripts. Meaning that individuals, regardless of the normative script primed, are more likely to reciprocate to the ingroup when playing in the distinguished groups. This shows the strength of norms of ingroup favouritism even in the face of competing norms. The results did however, also show that, when primed, the normative script of fairness lowered the amount of ingroup reciprocation and increased the amount of outgroup reciprocation. These results suggest that although individuals are likely to favour the ingroup regardless of the prevailing norms when reciprocating, the norm of fairness can encourage individuals to be reciprocate in a way that they see as fair, to an extent, either by reciprocating to individuals who have relatively low resources in the game regardless of group affiliation or by reciprocating to individuals who have helped them regardless of group affiliation. This brings to mind Gouldner's (1960) moral norm of reciprocity. Fairness is in a sense a moral norm (see Folger, 1998) and Gouldner's moral norm of reciprocity is rooted in fairness, i.e. one should help those who have helped them regardless of group affiliation. The norm of fairness may make individuals feel that they have to help those who have helped them in the same way that the moral norm of reciprocity was posited to.

When the norm of competition was primed, it strengthened group-based reciprocation bias. Tajfel and Turner (1985) argued that, in the context of distinguished groups, individuals engage in intergroup competition in order to promote group distinctiveness. This study found that group-based reciprocation bias was highest when the norm of competition was primed as opposed to no norm being primed or more especially when the norm of fairness was primed. This shows that in the same way that norms that promote fairness can develop, where individuals somewhat forgo group belonging when reciprocating, norms that promote competition between groups can also develop, where individuals are rewarded even more for favouring the ingroup. This finding also shows that under certain conditions, where groups are motivated to compete, group-based reciprocation bias can be used as a tool to compete with other groups, ensuring that resources stay within the group.

Reciprocation

The status of individuals was also postulated to affect the pattern of reciprocation in intergroup contexts. Previous findings have shown that, in the context of illegitimate inequality, low status group individuals will practice ingroup favouritism and high status groups will practice outgroup favouritism as a compensatory measure (Rubin et al., 2014; Durrheim et al., 2016). The status condition was not seen to influence reciprocation. Individuals did not reciprocate differently from each other based on their status. This is different from previous interdependence research that used the similar methods and found that low status group favour outgroup members (Durrheim et al., 2016). This illustrates that there is a difference between simple outcome interdependence and reciprocation. Additionally, this also illustrates that while our measure of group-based reciprocation in intertwined with ingroup favouritism, it has distinct reciprocative elements.

As stated earlier, Gouldner (1960) argued that a moral norm of reciprocity that goes beyond the utilitarian explanation is necessary for maintaining social stability through reciprocity due to the, "…disruptive potentialities of power differences" (p. 174). Meaning, the disruptive potentialities of inequality in this context. He stated that due to power differences amongst individuals inherent in society, powerful individuals might attempt to gain benefits without reciprocating them. This circumstance is ripe for the crumbling of reciprocity and the social systems it maintains. The norm of reciprocity, however, stimulates the need to repay benefits that have been incurred from other individuals even in a situation where the power dynamics at play could lead to the exploitation of certain individuals. The findings of this study, that status does not influence reciprocation, could be explained by the norm of reciprocity. The findings suggest that individuals are not affected by the power differences in the game and reciprocate how they would otherwise reciprocate due to the norm of reciprocity. The norm of reciprocity may be stronger than any norm that would develop as a result of inequality. This is different from the norm of ingroup reciprocation that develops due to distinguished groups which appears to be stronger than the generalized norm of reciprocity.

In evolutionary models, reputation is one of many signs that signals the way in which an individual is likely to act in interactions. These signs could relate to various facets of behaviour, such as skill or dominance (Tennie et al., 2011). This study particularly focused on the evolution of reciprocation as a result of the evolution of individual's reputation with

regards to reciprocation. In contexts like those in the VIAPPL experiments, Tennie et al. (2011) argue that reputation plays a fundamental part in sustaining social cohesion. It provides incentive tools that reduce uncooperative behaviour, behaviour that goes against the expected and prevailing behaviour within the group, and influences the decisions of individuals in social interactions.

The challenge for evolutionary theories is to explain how such cooperative behaviour can evolve. Indirect reciprocity theory argues that cooperative persons benefit in the long run through increased cooperation from others. Here, the pricey initial act is an investment, as it is expected that it will be repaid at a later date (Tennie et al., 2011). In this situation, "…reputation is needed to establish cooperation. Uncooperative behaviour results in a bad reputation, which is associated with several disadvantages. As a result, reputation is a stabilising factor, reducing the likelihood of uncooperative behaviour" (Tennie et al., 2011, p. 3).

The results of the present research show the evolution norm of ingroup reciprocation over time. The finding that ingroup reciprocation (group-based reciprocation bias) becomes stronger over time in the VIAPPL experiment is an illustration of the effect of reputation. As discussed earlier, there were five time phases in the game. Individuals enter the game with an understanding of group dynamics and are for this reason more likely to reciprocate more to ingroup members at the outset (Yamagishi et al., 1999). Therefore it was not surprising to see that individuals reciprocated more to ingroup members then they did to outgroup members in the first phase, particularly in distinguished groups. The arguments of Yamagishi et al. (1999) need refinement in order to explain why reciprocation becomes progressively stronger as time advances in the game (i.e. in phases 2, 3, 4, and 5).

This can be explained by the evolution of the norm of ingroup reciprocation through its reinforcement over time (Tennie et al., 2011). The finding that ingroup reciprocation strengthens over time indicates that individuals are not static but are dynamic in their thinking (i.e. their thinking will evolve based on the actions of other individuals). At the beginning of the game, individuals seek to maintain a good reputation amongst ingroup members as they believe that ingroup members are the ones most likely to favour them due to previous experience. The results show that early in the game, ingroup giving was likely to be reciprocated and outgroup giving was unlikely to be reciprocated. This likely served to

reinforce the belief individuals had at the beginning of the game – that ingroup members were more likely to reward them. Individuals therefore gave more and reciprocated more to the ingroup as their convictions about the ingroup strengthened. This strengthens the norm of ingroup reciprocation and thus the evolution of reciprocation.

While previous research has focused on the evolution on inter-individual reciprocation (Nowak & Sigmund, 2005; Nowak & Sigmund, 1998a; Nowak & Sigmund, 1998b; Ohtsuki, Iwasa, & Nowak, 2009; Nowak, 2006; and Brandt, & Sigmund, 2006), this study focused on the evolution of the levels of intergroup reciprocation. These studies could not therefore show the strengthening of ingroup reciprocation and the strengthening of ingroup reciprocation.

Even though the norm of fairness was seen to develop when primed and influence reciprocation, it did not evolve over time in the same way that groups did. Ingroup reciprocation became stronger as time progressed while the norm of fairness did not alter the levels of reciprocation over time. Feldman (1984) argued that those norms that are beneficial to the group are more likely to be reinforced and are reinforced more strongly. Reciprocating to ingroup members rather than outgroup members is the most beneficial norm of reciprocation as it keeps resources within the ingroup. On the other hand, even the norm of fairness is socially acceptable; it is not beneficial to the ingroup and may therefore be reinforced less strongly than ingroup reciprocation. Individuals will subscribe most to the norms that are reinforced the strongest (Tennie et al., 2011) in order to maintain a good reputation. Therefore, in order to maintain a good reputation, if the norm of ingroup reciprocation is reinforced the strongest, individuals will reciprocate more to the ingroup and as this increased reciprocation will be reinforced more over time, and strengthen. This may not be the case for the norm of fairness as it is less beneficial to the ingroup. This norm is reinforced but not as strongly as ingroup reciprocation.

Game theory is usually employed in psychology, economics, and political science to study rational decision-making. In recent times, various forms of game theory have been used to study reciprocation, ingroup favouritism, and interdependence in the minimal group situation (Balliet, Wu, & De Dreu, 2014). These include trust games, prisoner's dilemma game, public goods dilemmas, and resource dilemmas. These methods however have limits. To address these limits, this study employed VIAPPL, which is an experimental software in

which the interactional aspects of social life can be realistically assessed in intergroup dynamics (Durrheim et al., 2016). As discussed earlier, the use of traditional game theory to study intergroup dynamics in the minimal group situation is often rigid. The use of VIAPPL allows for the dynamic assessment of various forms of group interaction in the minimal group situation.

This study has illustrated how VIAPPL can be used as a tool to study reciprocation in a generalized exchange context as well as the evolution of reciprocation in this context. This sort of analysis would not have been possible with standard methods of game theory including the matrices employed by Tajfel et al. (1971), Rabbie et al. (1989), or Yamagishi et al. (1999). The VIAPPL platforms has illustrated that individuals reciprocate more and more to the ingroup as time progresses in the game. It has also illustrated that, in a generalized context, individuals will engage in generalized reciprocity.

Contributions of Study

The main contribution of this study is to the understanding of the evolution of reciprocation in a generalized exchange context with the assistance of VIAPPL. As has been discussed, previous research on reciprocation and interdependence in general has employed conventional game theory, which makes the analysis of the evolution of reciprocation in a generalized context difficult. This study has shown that ingroup reciprocation norms can strengthen over time.

This study has also contributed to the literature by showing how normative scripts can influence reciprocation in the minimal group situation. Previous research has focused on how normative scripts influence ingroup favouritism and not necessarily how they influence reciprocation in the minimal group situation. This study showed that although ingroup reciprocation is pervasive in all situations in the group context, the norm condition of fairness can serve to moderate this.

The assessment of the influence of status in generalized context of reciprocation is also a novel contribution of this study. Previous research (Rubbin et al., 2014) has focused on the influence of status on ingroup favouritism rather than reciprocation. This study showed that status does not influence reciprocation.

Limitations

This study assessed the levels of ingroup and outgroup reciprocation in the minimal group context under various contexts (group context, normative scripts, and inequality). This study argued that individuals will reciprocate in order to build or maintain a good reputation in a particular context and that their behaviour will be reinforced or punished based on their behaviour. Even though this is the case, this study did not assess the reputation of individuals. For instance, in the group context, it was not assessed that the reputation of those individuals who gave to the outgroup was indeed lower than those who gave to the ingroup as the literature argued (Yamagishi et al., 1999; Tennie, 2011). The assessment of the reputation had the potential to strengthen the analysis of this study since it is postulated that individuals will reciprocate in order to maintain a good reputation.

Another limitation of this study is due to the statistical techniques employed. In an attempt to account for nesting autocorrelation in the data, this study employed statistical techniques that assumed interdependencies between individuals that resulted in the removal of real interdependencies between individuals. Future research needs to find a way to study these inter-individual interdependencies as they would provide valuable insight into inter individual reciprocation and the networks that develop within the larger context of intergroup interaction.

Chapter 6 Conclusion

Early conceptualizations of reciprocation postulated that individuals will reciprocate to all those individuals that help them either for utilitarian purposes (Malinowski, 1932) or for moral purposes (Gouldner, 1960).

The work of Thibaut and Kelley (1959) served to problematize this by pointing out the way in which group contexts can influence outcome interdependence amongst ingroup and outgroup members. The minimal group studies of Tajfel et al. (1971) illustrated the ways in which group dynamics can influence the distribution of resources between group members. While Tajfel and Turner (1985) explained these results in terms of Social Identity Theory, Yamagishi et al. (1999) explained the results in terms of bounded generalized reciprocity.

While the work of Yamagishi et al. (1999), Tajfel et al. (1971) and other works (such as Rabbie, 1989) have been monumental in our understanding of interdependence and reciprocation, this work has been limited by the tools employed to study interdependence and reciprocation.

The Virtual Interaction Application Platform gives researchers an opportunity to further research on reciprocation by allowing for the study of reciprocation in a truly generalized context as well as the evolution of reciprocation in the minimal group situation.

In addition to assessing the influence of group dynamics on reciprocation, this study intended to study the influence of normative scripts and status on reciprocation on reciprocation as well as the evolution of reciprocation over time.

Tajfel and Turner (1985) argued that individuals favoured ingroup members in order to improve their social identity which is linked to their confidence. However, Yamagishi and Kiyonari (2000, p. 117) point out when referring to Tajfel's et al. (1971) minimal group experiment, that there is, "…a residue of interdependence existing in the form of mutual or multilateral fate control". This observation is grounded on the recognition that the minimal group situation is not as minimal as was first thought. The minimal group situation was

thought to be void of an interdependence of the participants' interests; in that one's actions affected other participants' actions and that the actions of other participants indirectly affect one's interests. There is a mutual interdependence of individuals. When the outcomes of individuals are dependent ingroup and outgroup members, Yamagishi et al. (1999) argued that as a result of historical and evolutionary cues, individuals will reciprocate more to ingroup members, a norm of ingroup reciprocation develops. As Thibaut and Kelley (1959) pointed out, generally, there is a mutual fate control amongst ingroup members in social situations and individuals therefore favour ingroup members. Individuals import these cues into other group contexts, including the minimal group situation. This study therefore hypothesized that individuals would reciprocate more to ingroup members that outgroup members. The results of this study offered support for this hypothesis, illustrating that individuals are more likely to reciprocate to ingroup members in group contexts.

The argument of a generic norm of cooperation postulates that individuals may favour members of the ingroup merely due to the fact that it is a social norm, which refers to, "a social script prescribing favouritism or loyalty to one's group as an expected and socially approved behaviour" (Hertel & Kerr, 2000, p. 317). Hertel and Kerr (2000) illustrated that when norms other than ingroup cooperation are salient, such as equality or fairness, individuals distributed resources in accordance with the prescribed norm. The present study showed that, in a generalized context, the norm condition of fairness moderated ingroup reciprocation and increased outgroup reciprocation. It is assumed that in this norm, individuals became more likely to favour those with less resources when reciprocating rather than those of their own group. The norm of completion on the other hand strengthened group-based reciprocation bias. This suggests that in that same way that the norm of fairness can moderate group-based reciprocation bias, norms of competition can heighten group-based reciprocation bias.

This study did not find that intergroup inequality influenced reciprocation. Rubin et al. (2014) found that members of low status groups generally utilized two strategies to get over the inequity, compensatory ingroup favouritism and competitive ingroup favouritism. Rubin et al. (2014) thus argued that it is conceivable groups of lower status can employ ingroup favouritism in two different ways and for two different reasons. Ingroup favouritism was employed to compete with an outgroup of a higher status so as to achieve positive ingroup

distinctiveness. Rubin et al. call this approach competitive ingroup favouritism. Ingroup favouritism was also employed to compensate the ingroup for its low status so as to realize intergroup fairness. They call this approach compensatory ingroup favouritism. Therefore, competitive favouritism raises a low status group to a level better than that of the outgroup, while compensatory ingroup favouritism raises a group of a low status to a level that is the same as the out-group. Studies employing methods similar to the present study found that low status groups practice compensatory ingroup favouritism and high status groups practice compensatory outgroup favouritism in order to promote equality in the context of illegitimate inequality. Status was not seen to influence ingroup or outgroup reciprocation in this study. Gouldner's (1960) moral norm of reciprocity may explain why status did not influence reciprocation. The power disparities created by the inequality may be overpowered by the moral norm of reciprocity.

In evolutionary models, reputation is one of many signs that signal the way in which an individual is likely to act in interactions. These signs could relate to various facets of behaviour, such as skill or dominance (Tennie, Frith, & Frith, 2011). This study, however, focused on behaviour in reciprocal interactions, and on reputation as an indication of the level of cooperativeness and reciprocity in various types of interactions, such intergroup interactions. This study illustrated that in group contexts, group-based reciprocation bias strengthens over time.

Studies examining this process have also been conducted using two player games. These games are dyadic is nature and do not allow for a generalized interaction. Generalized reciprocity and reputation cannot be observed in this situation as group of individuals cannot effectively observe the actions of other individuals and form opinions regarding those individuals' reputations as well as have the opportunity to react accordingly. Those individuals are also not afforded the opportunity to respond and allow for the evolution of their reputations. With the help of a new technology (VIAPPL), many of the shortcomings of previous reciprocation and interdependence studies have been addressed in this study. This study has been able to study reciprocation in a generalized context as well as assess the evolution of reciprocation in a generalized context. Additionally, this study has been able to quantify the level of reciprocation in ways that previous studies were unable to due to methodological limitations. The studies of Yamagishi et al. (1999) as well as Nowak and

Sigmund (1998) studied whether or not individuals reciprocate and not necessarily the amount of reciprocation in each act.

The results of this study add to the understanding of how discrimination in society develops by showing the conditions that can influence ingroup favouritism through reciprocation. The results of this study can aid future research in understanding how the processes of interaction and reciprocation between individual can promote and strengthen intergroup discrimination. Additionally, the norm of reciprocation is essentially a norm of social influence. Due to the importance of technology, of particular interest recently is the study of how individuals can be persuaded - through their desire reciprocate - to divulge passwords and other sensitive information (Happ, Melzer, & Steffgen, 2016). Little research however, has studied how group identification can influence social influence through reciprocation in this area and the results of this study (that ingroup reciprocation is stronger than outgroup reciprocation) show that this may be a valuable avenue of research.

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Appendices

Appendix 1: Ethics Approval

UNIVERSITY OF KWAZULU-NATAL
INYUVESI YAKWAZULU-NATALI

27 January 2014

Prof Kevin Durrheim
School of Applied Human Sciences
Pietermaritzburg Campus

Dear Prof Durrheim

Protocol reference number: HSS/0021/014
Project title: An experimental study of intergroup behaviour in a minimal group setting: Examining the impact of status and norms on ingroup bias

Full Approval – Expedited

This letter serves to notify you that your application in connection with the above has now been granted **Full Approval**

Any alterations to the approved research protocol i.e. Questionnaire/Interview Schedule, Informed Consent Form, Title of the Project; Location of the Study, Research Approach/Methods must be reviewed and approved through an amendment /modification prior to its implementation. Please quote the above reference number for all queries relating to this study. PLEASE NOTE: Research data should be securely stored in the school/department for a period of 5 years.

Best wishes for the successful completion of your research protocol

Yours faithfully

.....
Dr Shenuka Singh (Chair)
Humanities & Social Science Research Ethics Committee

/pm

cc Supervisor/Project Leader : Professor Kevin Durrheim
cc Academic Leader: Professor DP McCracken
cc School Admin: Mr Sbonelo Duma

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